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S. HRG. 98-622

NATIONAL DEFENSE STOCKPILE

HEARINGS

BEFORE THE

SUBCOMMITTEE ON PREPAREDNESS

OF THE

COMMITTEE ON ARMED SERVICES
UNITED STATES SENATE

NINETY-EIGHTH CONGRESS

FIRST SESSION

OCTOBER 19 AND NOVEMBER 18, 1983

Printed for the use of the Committee on Armed Services

U.S. GOVERNMENT PRINTING OFFICE

29-560 O WASHINGTON : 1984

S201-31

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NATIONAL DEFENSE STOCKPILE

WEDNESDAY, OCTOBER 19, 1983

U.S. SENATE,
SUBCOMMITTEE ON PREPAREDNESS,
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

The subcommittee met in open session, pursuant to notice, at 3:02 p.m., in room SR-222, Russell Senate Office Building, Senator Gordon J. Humphrey (chairman) presiding.

Present. Senators Humphrey and Levin.

Staff present: George K. Johnson, Jr., and David S. Lyles, professional staff members; and Marie Chaillet, staff assistant.

Also present: Dennis P. Sharon, assistant to Senator Goldwater, and Ron Kelly, assistant to Senator Humphrey.

OPENING STATEMENT BY SENATOR GORDON J. HUMPHREY, CHAIRMAN

Senator HUMPHREY. The Preparedness Subcommittee meets today to receive testimony in respect to the national defense stockpile.

I apologize for my tardiness. We had three rollcall votes. With a little luck, we will get through our hearing, which I believe won't require more than an hour, without another vote.

Let us begin with the statement of Mr. Jones.

STATEMENT OF HON. CARROLL JONES, COMMISSIONER, FEDERAL PROPERTY RESOURCES SERVICE, GENERAL SERVICES ADMINISTRATION

Mr. JONES. Thank you, Mr. Chairman.

Mr. Chairman and members of the subcommittee, I am Carroll Jones, Commissioner of the Federal Property Resources Service in the General Services Administration [GSA]. On behalf of Mr. Gerald Carmen, the Administrator, I appreciate the opportunity to comment on the subject of stockpile management.

GSA has been in the stockpile business since the agency was established in 1949 and thus has accumulated more than three decades of experience in all aspects of stockpile operations and management, including disposals, acquisitions, market research, contract administration, materials handling, packaging, storage quality assurance and protective security of inventories.

The restructuring of the stockpile by selling excess materials authorized for disposal and using the proceeds to purchase needed

materials began in earnest in 1981 when President Reagan announced the first major acquisition program since the early 1950's.

Following this announcement, GSA let contracts for $78 million of high-priority materials in fiscal year 1981, $62 million —includes materials exchange—in fiscal year 1982 and $145 million in fiscal year 1983.

Materials acquired to reduce stockpile goal deficits included Jamaican metallurgical grade bauxite, refractory bauxite, beryllium metal, cobalt, iridium, quinidine, tantalum minerals and vanadium pentoxide.

With anticipated funding availability for acquisitions of approximately $147 million—including carryover funds—in fiscal year 1984, further accomplishment is indicated in improving the Nation's emergency readiness posture. Still remaining after recent acquisitions are stockpile goal deficits of about $10 billion.

Stockpile materials on hand at more than 100 storage locations currently have an approximate value of $11 billion. Of this total, about $4 billion represents excess holdings. Industrial diamond stones, silver, tin and tungsten comprises the bulk of these inventories by value. GSA sold about $61 million of materials that were authorized for disposal in fiscal year 1983. Disposals of industrial diamond stones and tin accounted for 80 percent of this activity.

The President's materials and minerals policy statement of April 5, 1983, indicated clearly the need for continued rebuilding of the stockpile. We, at GSA, support this initiative and plan to make further progress with resources available to us.

We believe that there are no major problems in the current management apparatus for the National Defense Stockpile. Because stockpiling issues cover a broad spectrum of national security and economic issues, jurisdiction among agencies sometimes overlap: however, the core of the stockpile management apparatus—the shared responsibilities of the Federal Emergency Management Agency [FEMA] and GSA—function well.

FEMA currently decides what materials should be included in the stockpile and GSA controls the acquisition, disposal, processing and storage of stockpiled materials. Because, in general, FEMA is concerned with defense and essential civilian needs while GSA actions are based on the commodity marketplace, stockpile activities tend to be a useful combination of policy and operational views. We believe this check-and-balance system should not be altered.

[The excess stockpile inventories list follows:]

EXCESS STOCKPILE INVENTORIES

[Amounts excess (millions of dollars) [1] Sept. 30, 1983]

Commodities	Unit	Quantity	Value
Antimony	Short tons	3,841	6.453
Nonstockpile grade	do	1	.002
Asbestos amosite	do	25,398	17.791
Nonstockpile grade	do	1	.001
Asbestos chrysotile	do	6,727	13.290
Nonstockpile grade	do	915	.128
Diamond stones	Carats	7,797,511	113.064
Diamonds IND CR BORT	do	192,880	.338
Iodine	Pounds	1,706,912	11.761

EXCESS STOCKPILE INVENTORIES—Continued

[Amounts excess (millions of dollars) [1] Sept. 30, 1983]

Commodities	Unit	Quantity	Value
Nonstockpile grade	do	4,474	.031
Manganese chemical GR	Short dry tons	24,565	2.014
Nonstockpile grade	do	89	.007
Manganese dioxide BAT NAT	do	119,634	9.810
Nonstockpile	do	33,561	1.510
Manganese MET (nonstockpile grade)	do	957,943	9.986
Mercury	Flasks	167,815	50.344
MICA MF 1st & 2nd Quality	Pounds	1,134, 338	13.262
Nonstockpile grade	do	640	.002
MICA MS	do	5,415,225	8.123
MICA PS	do	741,234	1.482
Quartz crystals	do	1,467,224	8.803
Nonstockpile grade	do	2,068	.012
Sapphire and ruby	Carats	16,305,502	.179
Silicon carbide	Short tons	51,550	23.197
Silver	Troy ounces	137,505,946	1,651.446
Talc block and lump	Short tons	1,053	.421
Thorium nitrate	Pounds	6,529,350	17.956
Tin	Long tons	146,288	1,987.968
Tungsten ores and conc	Pounds tungsten metal content	2,828,337	13.604
Nonstockpile grade	do	29,489,321	141.844
Vegetable tannin chestnut	Long tons	9,732	6.540
Vegetable tannin quebracho	do	106,324	73.046
Veg tan wattle (nonstockpile grade)	do	1	.001
Asbestos crocidolite	Short tons	831	.291
Celestite	Short dry tons	13,415	.201
Kyanite	do	140	.014
Nonstockpile grade	do	1,047	.105
Mercuric oxide	Pounds	712,202	3.924
MICA MB stained and lower	do	181,373	.272
Rare earth	Short dry tons	504	.726
Talc—ground	Short tons	1,089	.006
Lithium	Pounds	15,885	.031
Lithium (Department of Energy)	do	79,962,349	154.327
Mercury	Flasks	35,305	10.591
Vanadium	Short tons of vanadium metal content	2	.024
Yttrium	Pounds	237	.010
Total			4,354.939

[1] Legislative authority does not exist presently to dispose of all these items.

Mr. JONES. Mr. Chairman, this concludes my statement. At this time, I would be pleased to respond to questions you or the members of this subcommittee may have.

Senator HUMPHREY. Thank you, Mr. Jones.

Let us have Mr. Maguire's statement next.

STATEMENT OF HON. BERNARD A. MAGUIRE, ASSOCIATE DIRECTOR FOR NATIONAL PREPAREDNESS PROGRAMS, FEDERAL EMERGENCY MANAGEMENT AGENCY, ACCOMPANIED BY PAUL K. KRUEGER, ASSISTANT ASSOCIATE DIRECTOR FOR RESOURCES PREPAREDNESS, FEDERAL EMERGENCY MANAGEMENT AGENCY

Mr. MAGUIRE. Mr. Chairman and members of the subcommittee, I welcome this opportunity to testify on behalf of the Federal

Emergency Management Agency [FEMA] on the subject of the National Defense Stockpile of strategic and critical materials.

My remarks today will focus on the general management and funding of the stockpile program. In particular, I would like to discuss the following specific issues:

One. Restructuring of the current stockpile.

Two. Financing of stockpile acquisitions.

Three. Stability of goals.

Four. Physical condition of stockpile inventory.

Five. Upgrading of stockpile material.

FEMA is responsible for mobilization planning for the civilian sector in support of national defense objectives. As the Associate Director for National Preparedness, I am tasked with policy formulation, planning, and coordination of national security programs in the civilian sector, including such areas as industrial mobilization preparedness. With this framework, I am concerned with availability of the resources that industry uses and in the ways that these resources can be brought to bear to meet national security needs. Within the area of industrial mobilization, FEMA has a special responsibility in natural resources policy and planning—the National Defense Stockpile of strategic and critical materials.

The purpose of the National Defense Stockpile, as defined in section 2 of the Strategic and Critical Materials Stock Piling Act, is to decrease and preclude, when possible, a costly and dangerous dependence upon foreign sources of supply of strategic and critical materials needed for national defense. In meeting this purpose, stockpile goals are established for strategic and critical materials based on military, basic industrial and essential civilian requirements projected to be needed during 3 years of a national emergency.

The stockpile is comprised currently of 61 groups of industrial material stored at 113 locations in the United States. The existing stockpile inventory is valued at over $11.3 billion.

RESTRUCTURING THE STOCKPILE

One problem facing the management of the stockpile is the need to restructure the composition of the current inventory of stockpile materials. For 24 of 61 groups of materials, the current inventory is in excess of the goals.

The value of the excess inventory is about $4.4 billion at current prices. Disposal of these excess materials would provide funds for acquiring needed stockpile materials while reducing storage and maintenance costs for unneeded materials. For 37 of the 61 groups of materials, the current inventory is less than the goals, leading to shortfalls in needed materials. To fill the shortfalls for these materials would require acquisition of additional materials valued at about $9.8 billion in current prices. The acquisition and disposal of such quantities of materials need to be phased over a number of years if the statutory proscription to avoid market disruption is to be met. In this regard, a prerequisite to the more effective administration of the restructuring of the National Stockpile is congressional action authorizing the orderly disposal of current stocks of material excess to stockpile goals.

FINANCING STOCKPILE ACQUISITIONS

A second issue concerns the financing alternatives to support the restructuring of the composition of the stockpile inventory. Since 1979 the primary funding source for acquisitions of stockpile materials has been the proceeds from disposals of excess materials currently in the stockpile.

These proceeds are covered into the National Defense Stockpile Transaction Fund established by section 9 of the Stock Piling Act and are available for acquisition of materials needed for the stockpile. Even if all excess materials in the stockpile could be sold swiftly without unduly disturbing the markets, however, there would still remain a considerable shortfall in reaching the goal levels of strategic and critical materials needed for the stockpile. Many of the materials we now hold may require years to sell because of the sensitivities of the commodities markets.

BARTER

In addition to cash procurements funded through the Transaction Fund or through alternate appropriations, however, there is another method to help relieve shortfalls in meeting stockpile goals: The barter of Government materials and property in return for strategic and critical materials needed for the stockpile. Since barter may be less efficient than competitive cash acquisitions through the marketplace, reduced quantities of stockpiled materials may result. Under section 6 of the Stock Piling Act, Congress has mandated that barter is to be encouraged in the acquisition of materials for the stockpile where it is practical and in the best interests of the United States.

The administration has used barter twice under existing legislative authorities: To acquire Jamaican bauxite and to upgrade ores into ferroalloys.

STABILITY OF GOALS

A third major issue in stockpile management concerns the setting of goals for stockpile materials. Over the years since the stockpile was first established in 1939, a number of different preparedness mandates were reflected in wide variations in the materials identified to be stockpiled and the respective amounts of such materials needed.

Cycles in these variations persisted until the Congress revised the Stock Piling Act in 1979. That revision explicitly mandated certain fundamental principles that were designed to stabilize the goals for stockpile materials. These guidelines are:

One. That the quantities of materials stockpiled should be sufficient to sustain the United States for a period of not less than 3 years in the event of a national emergency.

Two. That the materials are those needed to supply the military, industrial and essential civilian needs of the United States for national defense.

Three. That the stockpile is not to be used for economic or budgetary purposes.

During the period that these principles have been part of the statutory guidance for stockpile management, there has been notable stability in goals for stockpile materials.

CONDITION OF THE STOCKPILE

The fourth issue concerns the physical condition of materials in the stockpile inventory. In recent years concerns have arisen about the quality and forms of materials held in the stockpile. Many of the materials have been in the stockpile since the 1950's, and significant changes have taken place in industrial technology since this time. Requirements for many strategic and critical materials have become more stringent and in some cases the dominant form has changed.

Under the National Materials and Minerals Policy, Research and Development Act of 1980, FEMA has initiated three studies to assess the quality of materials in the stockpile. These studies are being conducted through an interagency effort by expert panels of industry users, producers, and suppliers of strategic and critical materials. These studies are designed to examine in detail the existing and required qualities and forms of materials for each major use classification.

UPGRADING STOCKPILE MATERIALS

A related issue of considerable interest to us as stockpile managers deals with upgrading. To the extent that advances in industrial technology now require upgraded forms of stockpile materials, the administration reviews the composition of the stockpile against the desired composition.

On December 3, 1982, the administration announced that an exchange of excess stockpiled materials would be used in an upgrading program to help maintain the emergency mobilization base of the domestic ferroalloy industry.

The program will produce approximately 577,000 short tons of high-carbon ferromanganese and 519,000 short tons of high-carbon ferrochromium during the next 10 years. This action will provide upgraded products to the national stockpile for immediate use in the case of a national emergency. As a general rule, we have elected to postpone upgrading programs until our highest-priority materials have been acquired with the limited cash resources presently available.

PROGRAM ACCOMPLISHMENTS

I wish to end my testimony with accomplishments achieved since the 1979 Stock Piling Act. Among these accomplishments are:

One. The long-sought stability in stockpile goals has been achieved by focusing on requirements for 3 years of a conventional war.

Two. The first stockpile acquisitions in 20 years have occurred.

Three. We have been the first barter to acquire stockpile materials in 15 years.

Four. We have reinstituted an exchange program to upgrade stockpile materials.

Five. We have established an annual materials plan with 4-year forward estimates for effective implementation in reaching goals within approved funding limitations and congressionally-imposed disposal limitations.

AGENCIES INVOLVED IN BARTER POLICY

These initiatives have enhanced mobilization preparedness and are just the beginning in the needed restructuring of the national defense stockpile.

Mr. Chairman, that completes my prepared remarks. I would be pleased to address any questions you or other members of the subcommittee might have on the national defense stockpile.

Senator HUMPHREY. Thank you.

Mr. Jones, on page 2 of your testimony you mention that stockpiling issues cover a broad spectrum and that jurisdictions among agencies sometimes overlap.

What kind of problems? Can you give us an example of why that is a problem? Is that a problem and if so, what?

INTERAGENCY COORDINATION

Mr. JONES. I think, Mr. Chairman, it really depends on exactly what we are focusing on.

In the normal operation, in other words, our acquisitions, there is an overlap, the annual material plan which is a product of an interagency committee which is chaired by the Federal Emergency Management Agency, has to be prepared.

We are players in producing it, but it is the province of FEMA and we are not able to acquire any materials until we have an annual material plan filed. Now, that slowed us down last year. It was not filed with the budget as it is stated in the law. We finally got that straightened out and got it filed so that we could move along with our acquisition program.

When it comes to establishing specifics, in other words, establishing the quality of a particular commodity, that falls under the Department of Commerce.

I would just offer that once again here you have to have three agencies involved before you can go out and acquire a single commodity and they each have separate things to do. In fact, what actually happens as far as Commerce, by and large, they depend on us to assist them because I have all the technicians who are up to date in the specifics.

So, perhaps it has been fragmented a little bit too much, but, of course, that was established by the Executive order.

Senator HUMPHREY. In this case why can't we eliminate the Commerce Department?

Mr. JONES. That is something we are actively discussing, Mr. Chairman. It is my impression that the Commerce Department is cooperative and we are going to see if we can accomplish this.

Senator HUMPHREY. Even when the agencies are cooperative, it is still a handicap to have to deal with more than is necessary, more than the bare minimum. We will be happy to look into matters of this kind to assist GSA and FEMA to eliminate some of this overlapping jurisdiction if it is in the national interest.

AGENCIES INVOLVED IN BARTER POLICY

Mr. JONES. Now, to approach another topic, Mr. Chairman, when we become involved in such a thing as barter, then we become involved with agencies all over town, the Treasury, Trade Representative, the State Department, FEMA, it goes on and on. We have just about every agency in the Government that becomes involved when we are even discussing the topic.

Senator HUMPHREY. How much did GSA request for fiscal year 1984 before its requests were reduced by OMB?

Mr. JONES. I believe it was $340 million, Mr. Chairman.

Senator HUMPHREY. OMB reduced it to what?

Mr. JONES. $120 million.

Senator HUMPHREY. What is your opinion on the adequacy of that level?

REVOLVING FUND FINANCING

Mr. JONES. Mr. Chairman, we have contended all the way along that indeed the transaction fund was intended to be a revolving fund. If I have $200 million in there, I ought to be able to spend $200 million. If I don't, then I don't. That has been our position.

We have had disputes, I believe the Treasury Department is in agreement with us, and that we could set aside this dispute and make it an off-budget item and if I have the funds, they can be spent. If I don't, they can't.

Senator HUMPHREY. What justification did OMB give then? The money is there, but they are not permitted to spend it. What justification did they give you?

Mr. JONES. Not to directly answer your question at this point, the fact remains I have spending authority for $120 million which is just about what money I have in the fund at the present time.

Unless we are dealing with illusory numbers, for example, this past year the total disposal amounted to around $60 million. So that with $120 million—in fact, we spent over $140 million this year—the fact remains that these real numbers that are in the fund in the very short future are not going to be up to the amount of $120 million which was provided to us.

We have no authority to dispose of silver which is probably the most easily liquidated item in the stockpile. That is what is keeping us at these lower levels.

Senator HUMPHREY. You are projecting how much money will be available during fiscal year 1984?

Mr. JONES. Well, with the carryover around $140 million. It is no-year money, carrying over from fiscal year 1983.

Senator HUMPHREY. Why did you make a greater request in your budget submission?

Mr. JONES. We made the request predicated on the hope that we would be able to dispose of silver. If you look back historically, GSA has sold between 2,000 and 3,000 tons of tin on a year-to-year basis with the exception of that short period of time when there was manipulation of the tin market in December 1981 and January 1982.

The remainder of the time historically if you remove that bubble, we have sold 2,000 to 3,000 tons.

Now, the other items for which we have disposal authority are faced with an extremely sluggish market, there having been a world recession that it has not pulled out of. So, our disposals are quite slow.

We do sell annually about $20 to $25 million worth of diamond stones. Other than that, without the silver, we are not going to be able to meet the projections of the $120 million.

STUDY ON SILVER SALES

Senator HUMPHREY. What are the congressional restrictions on the sale of silver at this time?

Mr. JONES. The Congress directed the President to conduct a study to determine whether we should dispose of silver or whether it should be retained in the stockpile.

The President in turn assigned the duty of completing that study to the cabinet Council on National Resources which was chaired by Secretary Watt.

I inquired, with Director of OMB, written to Secretary Watt, inquiring about the whereabouts of the study because under the terms of the legislation which directed it, we cannot dispose of silver until such time as it has been filed.

Up to the present moment, I have received no satisfactory answer on when the silver study will be filed or why it has not been completed up to this point.

Senator HUMPHREY. No satisfactory answer. That means you reveived no answer or what sort of answer have you received?

Mr. JONES. The only answer is that we are working on it and it is going slowly. That is the response by the Assistant Secretary in charge.

Senator HUMPHREY. No estimated date of completion?

Mr. JONES. None.

Senator HUMPHREY. There is no date mandated by the legislation?

Mr. JONES. There was a date. I believe it was July 1982 that it was to be filed.

Senator HUMPHREY. I am going to make an inquiry and do whatever I can to speed up that study. If necessary, we will take whatever measures are required.

With $120 million, Mr. Jones, at this rate, how long will it take us to address the critical shortfalls in the stockpile?

Mr. JONES. It is a shortfall. Given total inventory of $11 billion of which $4 billion is in the excess category, at the rate of $120 million a year we should be there in the year 2083.

Senator HUMPHREY. That is encouraging. At least we have a date in that case.

Mr. JONES. Yes, sir.

Senator HUMPHREY. Have you made projections for fiscal year 1985, and so on, in terms of purchases?

Mr. JONES. We don't have the answer for 1985, we don't know the annual material plan for 1985. So, we have not yet determined which specific commodities.

What I am concerned about 1985 is if there will be any funds in there at all at that point in time.

SILVER DISPOSAL AUTHORITY

Senator HUMPHREY. Mr. Maguire, what do you mean by in your testimony on page 2 when you say, "A prerequisite to a more effective administration is congressional action authorizing orderly disposal of current stocks of materials excess to stockpile goals." What do you mean?

Mr. MAGUIRE. As the Commissioner has testified, the disposal of silver is on hold by congressional action at this point in time. A congressional mandate is needed in order to dispose of further silver in the stockpile.

Senator HUMPHREY. So, you are addressing silver on that point, is that it?

Mr. JONES. Essentially, sir.

Senator HUMPHREY. Mr. Jones, are there other commodities whose trade is restricted by Congress?

Mr. JONES. We have disposal authority. We have to receive disposal authority to dispose of any commodities. We have the authority on most of the other items.

We are going to require further authority on diamond stones. We have it for this year, but we will be seeking further authority. It is an item that we dispose of in fairly large amounts.

The problem with the other commodities such as tungsten and manganese and others that we have disposal authority for, there simply is no market for them or a very depressed market. That, of course, limits our disposal.

We are under obligation to exercise caution so that we do not disturb the marketplace, cause undue disruption.

QUALITY OF STOCKPILE MATERIALS

Senator HUMPHREY. Mr. Maguire, FEMA has initiated three studies under the Material and Minerals Policy Act of 1980.

When are these studies going to be concluded? This is on the quality of materials.

Mr. MAGUIRE. Yes, sir, the first study was conducted by the American Society for Metals to assess the quality and form of cobalt in the stockpile.

The cobalt study was recently concluded and the final report and recommendations are now being reviewed for possible action.

The second study being conducted by the National Materials Advisory Board of the National Research Council is to determine which, if any, of the other materials in the stockpile should have quality assessments and to recommend an order of priority for further investigation.

The second study by the National Materials Advisory Board should be finished in about 6 months.

A third study on chromium has recently begun by the American Society for Minerals.

Senator HUMPHREY. That will be completed when?

Mr. MAGUIRE. I have no predicted date, Senator. I will provide that for the record.

[The information follows:]

The American Society for Metals quality assessment study on high-purity chromium metal is scheduled to conclude on June 30, 1984. The National Materials Adviso-

ry Board (NMAB) study to determine which additional materials need quality assessments will be finished by March 31, 1984.

Senator HUMPHREY. Are there any deadlines specified in the act of 1980?

Mr. MAGUIRE. I will have to ask Paul Krueger, my Assistant Associate Director, to assist in that. It was our initiative. There were no requirements stipulated in the act.

Senator HUMPHREY. Will you provide us with a copy of the report on the cobalt study?

Mr. MAGUIRE. When a final report is prepared, I will.

[The information follows:]

A copy of the final report of the FEMA sponsored study entitled "Quality Assessment of National Defense Stockpile Cobalt Inventory" is enclosed for the record.

QUALITY ASSESSMENT OF NATIONAL DEFENSE STOCKPILE COBALT INVENTORY

Final Report
of the
American Society for Metals Panel

Prepared for
Federal Emergency Management Agency

This report was prepared in fulfillment of Federal Emergency Management Agency contract EMW-C-1023 awarded to American Society for Metals. The work performed was under the supervision of Allen G. Gray, Technical Director of ASM, assisted by James P. Hontas, Assistant Director Development, ASM.

ASM's contractual responsibility consisted primarily of forming the panel with government approval of its membership, eliciting the technical information assessing the quality of the government's cobalt inventory, and management of the project.

Disclaimer. The data, opinions, conclusions, and recommendations contained in this report are solely those of the members of the ASM Panel for the Quality Assessment of National Defense Stockpile Cobalt Inventory. Release of the final report for public distribution does not imply that American Society for Metals accepts, approves, or endorses the contents.

American Society for Metals
Metals Park, Ohio 44073
30 August 1983

ABSTRACT

The panel of industry experts assembled by the American Society for Metals, at the request of Federal Emergency Management Agency, conducted a quality assessment of the National Defense Stockpile cobalt inventory to determine its utility for present and near future applications. Emphasis was on the technical requirements for the critical uses, the degree of technological obsolescence of the stockpiled cobalt most of which represents a technology level 25 years old, and actions that should be considered to assure timely availability and reliability in a national emergency.

The panel's findings and recommendations are categorized under quality grades required for specific applications, composition limits of each grade for the most critical and other usage requirements, selection of candidate stockpile cobalt for preprocessing, and existing chemical and metallurgical processing technology for upgrading. Extensive expenditures for sampling and analyses, in the opinion of the panel, are not justified because the results will only confirm that the pre-1980 stockpile cobalt cannot be relied upon for the most critical usage. Specific pilot tests are recommended to develop information on preferred procedures for upgrading the quality of the stockpile cobalt which could be applied by government on a large scale or implemented immediately by industry in a crisis.

29-560 O—84——2

EXECUTIVE SUMMARY
OF ASM PANEL'S FINDINGS AND RECOMMENDATIONS

Cobalt is a strategic and critical metal without substitutes in many defense and industrial applications. The National Defense Stockpile contains 40.8 million pounds of cobalt purchased during 1947-61 (pre-1980) and 5.2 million pounds purchased 1981-82. In its present condition, the quality of the pre-1980 cobalt precludes its use for producing vacuum processed alloys for defense and industrial applications.

The pre-1980 cobalt met the requirements of technology existing some 25 years ago, but limitations on composition have since become more stringent to meet end product performance requirements. The post-1980 stockpile cobalt meets the quality requirements of current technology for the most critical defense and industrial applications.

This study by the industrial panel assembled by American Society for Metals addresses options for alleviating vulnerability in material technical deficiencies, including remedial measures that can be pursued with industry which has offered to bear the costs of pilot tests to develop procedures to upgrade quality of pre-1980 stockpile cobalt.

The panel's principal recommendations are summarized below.

Recommendation

Establish three quality grades of cobalt for the National Defense Stockpile and define the quantities of each grade required for applications that are critical to defense and industrial production.

Background - The same degree of quality is not needed for all applications. Three quality grades will meet all end product requirements. These are designated as: grade 1 for applications where composition is most critical, including superalloys for aircraft jet engines; grade 2 for applications where composition is less critical, including most magnetic alloys and corrosion and high strength alloys; grade 3 for applications where composition is least critical including chemical industry products (existing stockpile quality is adequate).

Assurance that adequate quantities of grade 1 cobalt can be made available for immediate use for production of vacuum processed superalloys is an important consideration.

Recommendation

Adopt composition limits identified in Table 2-1 to control the quality of grade 1 and grade 2 stockpile cobalt.

Background - All of the pre-1980 cobalt is suitable for use as grade 3 quality. Some of the pre-1980 cobalt may qualify as grade 2 quality.

The composition limits identified for grade 1 and grade 2 are intended to serve as a standard for determining the efficiency of processes to upgrade pre-1980 cobalt quality and as a guide for procurement specifications.

Recommendation

Accept industry's offer to conduct pilot tests at its own expense utilizing existing chemical and metallurgical processing technology to determine the most efficient procedures for upgrading the pre-1980 cobalt.

Background - The chemical and metallurgical industries have processes and equipment in place to upgrade the quality of stockpile cobalt. Company representatives on the panel offered to run pilot tests to:

1. Evaluate chemical processing methods as a means to produce feedstock for extra fine powder for carbide cutting tools and to produce high purity powder compacts for superalloys.

2. Determine which of the metallurgical processing systems used by the specialty steel industry is most efficient for upgrading quality.

Recommendation

Conduct production scale runs to verify the results of the most efficient pilot tests and document recommended commercial practice that could be followed by industry for upgrading pre-1980 stockpile cobalt should a national emergency arise before adequate quantities of grade 1 cobalt are available either through refining or procurement.

ASM Panel on Quality Assessment of
National Defense Stockpile Cobalt Inventory

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Chapter 1

Introduction

Cobalt is a highly strategic and critical metal because of its significant import dependence and its essential uses in defense and industrial products. The major material applications requiring cobalt are summarized in Table 1-1.

Domestic consumption of cobalt deteriorated significantly in 1981 and 1982 reflecting generally recessionary economic conditions and trends toward substitution and conservation resulting from previous price escalations. U.S. consumption for 1981 declined to 11.7 million lb about 24% less than that of 1980 according to the Bureau of Mines. Consumption for 1982 was 9.5 million lb; it was 18.8 million lb in 1979 and 20.4 million lb in 1978.

Table 1-1. U.S. Consumption of Cobalt, by End Use

Application	Quantity, 1000 lb of contained cobalt (%) 1980	1982
Superalloys for jet engines	6,285 (41)	3,319 (35)
Magnetic alloys	2,267 (15)	1,544 (16)
Catalysts for chemical and petroleum industries	1,656 (11)	789 (8)
Cemented, sintered, and cast carbides	1,344 (9)	638 (7)
Paint driers	1,331 (9)	1,114 (12)
Other chemical and ceramic products	879 (5)	943 (10)
Welding materials	620 (4)	446 (5)
Steels	484 (3)	326 (3)
Other alloys	360 (2)	201 (2)
Miscellaneous and unspecified (a)	95 (1)	148 (2)
TOTAL	15,321	9,468

(a) Includes undisclosed amount for high strength low alloy steels and powder metal mill products.

Souce: U.S. Bureau of Mines

The National Defense Stockpile of critical and strategic materials comprises 91 commodities in categories of ores, metals, metal compounds, mineral and organic products. At present there are 46 million lb of cobalt in the stockpile inventory 40.8 million lb of which was purchased during 1947-1961.

The importance of stockpile quality was addressed in the President's National Materials and Minerals Program Plan and Report to Congress, released on 5 April 1982. This report, prepared by the Cabinet Council on Natural Resources and the Environment, committed the administration to assessing the stockpile. Particular interest has been expressed by the administration in getting industry cooperation in assessing stockpile quality problems, because industry will be called on to use stockpiled materials in times of national emergencies.

A. Objectives, Scope and Plan for the Study

Technological advances affecting usage requirements over the last 30 years have caused concern about tne quality of the pre-1980 stockpile cobalt and its timely availability for critical applications in event of a national emergency. Although the concern was directed primarily at the availability of high purity cobalt to produce superalloys for jet engines, an assessment of quality requirements over the broad spectrum of uses for the material also appeared to be desirable. It was recognized that the various defense and industrial uses for cobalt would not require the same degree of quality to meet end product performance standards and that a useful approach would be to define composition limits of grades for the different usage requirements.

At the request of the Federal Emergency Management Agency (FEMA), American Society for Metals (ASM) formed a panel of industry experts covering the spectrum of cobalt uses to assess the quality of the stockpile cobalt inventory and determine its utility in specific present and future applications.

Emphasis of the assessment is on the technological aspects of usage requirements, the potential degree of technological obsolescence, and action that should be considered to assure timely availability and reliability for vital defense and industrial uses in a national emergency. The political issues are not within the scope of this study.

Chapter 2

Summary of Panel's Findings and Recommendations

A. Definitions of Grades of Stockpiled Cobalt for End Product Performance Standards

Summary of Findings:

1, The panel assessed the pre-1980 stockpiled cobalt, which was acquired some 25 years ago, is in a state of technological obsolescence with respect to its quality for the most critical applications. This condition impairs its utility in a national emergency requiring timely availability and reliability for vital defense and industrial uses.

2. The panel recognized that the various defense and industrial uses for stockpiled cobalt do not require the same degree of quality to meet end product performance requirements. On this basis, the panel determined that three grades of cobalt would satisfactorily meet all usage requirements. Each grade is defined as follows:

Grade 1 Cobalt -- Composition required for the most critical applications:

Nickel base and cobalt base vacuum processed superalloys for aircraft jet engines; extra fine cobalt powder for cemented carbides (not needed for chemical process employed by one producer and may not be required by the other producer depending on results of pilot test on chemical purification); low nickel and high cobalt (over 25%) magnetic and electronic alloys; medical implant alloys; vacuum melted high strength ferrous alloys; vacuum melted corrosion resistant alloys.

Grade 2 Cobalt -- Composition required for less critical applications:

Air melted corrosion resistant alloys; magnetic and electronic alloys containing less than 20 - 25% cobalt; air melted nickel base and cobalt base superalloys; hard facing alloys; air melted high strength ferrous alloys; cobalt containing high speed steels.

Grade 3 Cobalt -- Composition required for least critical applications:

Air melted tool steels; products of chemical industry including petroleum catalysts, dryers, frits, and other compounds. The chemical industry has in place technology for purification by chemical treatment that can utilize the pre-1980 stockpiled cobalt and secondary materials.

Recommendations:

1. The government should define the quantities needed of the grades specified for applications that are critical to defense and industrial production. Considerations include:

a) Superalloys - assurance that sufficient quantities of grade 1 cobalt can be made available for immediate use in production of vacuum melted superalloys recognizing the constraints on capacity and time for preprocessing and upgrading during a crisis period.

b) Extra Fine Powder - provisions for adequate feedstocks for production of extra fine powder including full consideration of the alternative to high purity cobalt offered by chemical processing technology.

c) Magnetic and Electronic Alloys - grade 2 quality appears to be suitable for most applications with exception of certain high cobalt magnetic alloys. The panel suggested that additional information should be generated on specific quality requirements for cobalt for these uses including the cobalt rare earth magnetic alloys. The potential for higher cobalt prices, along with risk of availability, as well as changing performance standards in communications equipment, have caused substantial recent changes in technology and usage in these applications. Information gathering methodology such as employed by an Industrial Evaluation Board would be useful in determining these needs.

d) Chemical Industry - A portion of the pre-1980 cobalt, the quantity to be determined by the government, should be designated for use as-is in chemical product applications.

B. Specifications for Procurement and for Upgrading Pre-1980 Stockpile Cobalt.

Summary of Findings:

1. In accepting definitions of quality grades of cobalt for usage requirements, the panel developed specifications for composition limits of the designated grades to conform to industry processing practices and to meet end product performance standards. The composition limits in the specifications given in Table 2-1 are intended to serve as a target for determining efficiency of preprocessing to upgrade pre-1980 cobalt and for procurement of stockpile cobalt. Considerations in developing the specifications were:

   a) User experience with detrimental effects of undesirable trace elements, which is a factor contributing to the technological obsolescence of the pre-1980 cobalt particularly for jet engine superalloys, received strong consideration in formulating specifications for grade 1 quality cobalt. In addition to tightening some of the maximum limits for undesirable trace elements defined in existing specification P-13-R4, the panel established maximum composition limits for tellurium (Te), thallium (Tl) and mercury (Hg) for the grade 1 specification.

b) The panel strongly favored tight specifications for sulfur, phosphorus and carbon noting that the vacuum induction furnace employed for production of superalloys is not effective in removing these elements. Also, problems with undesirable trace elements may not be as serious in the pre-1980 cobalt as are the levels of sulfur, carbon and phosphorus.

c) The panel recognized that the grade 1 nickel limit (0.50% max) is greater than the limit (0.065% max) specified for production of extra fine powder by the Carolmet process and may not be acceptable for certain magnetic alloys. Because nickel at 0.5% max is not a problem in production of nickel base and cobalt base superalloys, which is the largest use for grade 1 quality cobalt, it is the panel's opinion that it is unduly restrictive to specify a lower level of nickel for this major application. This would limit sources for procurement of stockpile cobalt should that need develop and add unjustified requirements to the evaluation of preprocessing procedures.

Table 2-1. Composition Limits for Two Grades of Cobalt Recommended for the National Defense Stockpile

Element	Grade 1 % max	Grade 2 % max
Cobalt + nickel (Co + Ni)	99.9 min	99.0 min
Nickel (Ni)	0.5	0.5
Iron (Fe)	0.05	0.2
Manganese (Mn)	0.02	0.1
Copper (Cu)	0.004	0.03
Lead (Pb)	0.0005	0.0010
Zinc (Zn)	0.003	0.005
Silicon (Si)	0.01	0.1
Aluminum (Al)	0.01	0.05
Sulfur (S)	0.001	0.010
Carbon (C)	0.01	0.015
Hydrogen (H_2)	0.001	0.001
Oxygen (O_2)	0.01	0.030
Bismuth (Bi)	0.00005	0.0001
Arsenic (As)	0.0010	0.0010
Nitrogen (N_2)	0.001	0.002
Antimony (Sb)	0.0005	0.0010
Phosphorus (P)	0.003	0.005
Tin (Sn)	0.001	0.0025
Selenium (Se)	0.0005	0.0005
Silver (Ag)	0.0005	0.0010
Zinc + cadmium (Zn + Cd)	0.004	0.007
Tellurium (Te)	0.0005	0.0010
Thallium (Tl)	0.0005	0.0010
Mercury (Hg)	0.0005	0.001

d) The panel recognized that specifications should take into account future end-use performance standards and that the requirements on cobalt quality for future use will likely be more stringent than those for current technology particularly for aerospace applications. Expectations are that the future will call for extremely stringent limits on trace elements as well as on other more conventional elements including carbon (50 ppm for single crystal blades), sulfur and phosphorus. High purity powders for forging superplastic turbine discs and for rapid solidification powders have extremely tight specifications for undesirable elements.

Recommendations:

1. Alter composition limits of government specification P-13-R4 to those of grade 1 (Table 2-1) developed by the panel for most critical end product applications including vacuum melted nickel and cobalt base superalloys for jet engines. This specification is intended for procurement of stockpile cobalt and as the basis for determining the efficiency of preprocessing to bring pre-1980 cobalt to the quality level for the most critical applications.

2. The decision on preferred practice to assure adequate feedstock for extra fine powder should be made after tests are completed on chemical treatment of pre-1980 stockpile cobalt as feedstock for the Carolmet powder process and evaluation of the powder in carbide cutting tools has been completed. Chemical processing with established technology may provide a viable option on feedstock for the Carolmet process to avoid need for a special high purity grade of cobalt for this use. The GTE chemical process for extra fine powder does not require high quality cobalt. An alternative for the Carolmet process is a modified grade 1 quality specification with restrictions on nickel, calcium, and other elements as required.

3. Adopt the composition limits in the specification developed by the panel for grade 2 cobalt (Table 2-1) for less critical applications. This specification is to be used in developing preprocessing alternatives for less critical applications and for procurement of quantities of cobalt needed in less critical areas. However, in considering the quantities of grade 2, first priority should go to providing quantities of grade 1 that are adequate for an emergency.

4. In procurement negotiations on quality, which may arise, and in evaluations of preprocessing, the government should accept the panel's viewpoint that specifications should take into consideration that quality requirements for future end uses in critical applications will be more stringent than for current technology.

C. Selection of Candidate Pre-1980 Stockpile Cobalt for Preprocessing to Upgrade Quality.

Summary of Findings:

1. The panel recognized that it is not economically practical or necessary to consider upgrading all of the pre-1980 cobalt to grade 1 quality. However, there was no question that first priority should be to assure that adequate quantities of grade 1 quality can be made readily available in a national emergency.

2. To aid in the identification of an adequate quantity of pre-1980 cobalt for upgrading to grade 1 quality and to limit by anticipated usage the overall volume of material to be considered, FEMA specialists examined inventory records which disclosed that 20,341,561 pounds of granular cobalt is covered by one contract - GS-00P-331-SCM (contract 331). This was supplied by African Metals with deliveries from July 1953 to December 1957. The cobalt originated from Zaire (Belgian Congo) and is located in seven depots. The panel proposed that this identified volume of pre-1980 cobalt be used in preprocessing pilot tests and in full scale production runs to upgrade quality to grade 1.

Recommendations:

1. Utilize cobalt from contract 331 for preprocessing pilot tests and as charge material for full scale procedures to refine pre-1980 cobalt to meet requirements for grade 1 superalloy quality.

2. When required quantities of grade 1 quality have been assured, selection should be made of an identified volume of candidate material for preprocessing to grade 2 quality. It is understandable that experience gained in preprocessing for grade 1 requirements will provide useful information for grade 2 refining and some metallurgical processing intended for grade 1 quality may yield grade 2 quality.

D. Feasibility of Sampling and Analyses to Determine Acceptability of Pre-1980 Cobalt for Critical Usage Requirements.

Summary of Findings:

1. The panel recognized the complexity and cost of conducting acceptable sampling and chemical analyses for the pre-1980 cobalt, even if restricted to 20,341,561 pounds of cobalt in the 331 contract. Current records do not indicate whether stockpile lots are production lots or shipment lots, and the wide variation of lot sizes and number of containers complicate procedures for obtaining representative samples to fully assess the quality of the pre-1980 stockpile cobalt.

2. The consensus of the panel was that even after extensive expenditures to utilize acceptable procedures for sampling and analyses, the results would simply confirm what is already known that the pre-1980 cobalt can not be relied upon for use in applications where composition is most critical.

3. The panel felt that rather than expend extensive funds for analytical procedures it would be better to invest in pilot tests on preprocessing to develop procedures for upgrading the pre-1980 cobalt. This information and know-how could be applied for subsequent upgrading on a large scale or for implementation by industry in a crisis.

4. Upgrading should commence with precise chemical analysis of the consolidated feedstock to establish a basis for determining refining proficiency.

Recommendations:

1. Avoid extensive expenditures on statistical sampling and analyses of contract 331 cobalt because this high investment would only confirm unacceptability of pre-1980 cobalt for applications where composition is most critical and would not contribute to upgraded quality.

2. Incorporate chemical analyses as a part of pilot preprocessing tests to upgrade quality of contract 331 cobalt. Include requirements for initial complete analysis of candidate material selected for upgrading after consolidation into one lot (melt down) followed by analysis at each step in the preprocessing/upgrading procedures.

E. Chemical Processing Technology to Upgrade Pre-1980 Stockpile Cobalt

Summary of Findings:

1. Existing chemical processing technology for purification of cobalt, which is utilized for producing catalysts and cobalt compounds, provides a method for refining pre-1980 material to the quality level required for production of extra fine powder for cemented carbides. Chemical processing also offers a procedure for producing powder compacts for vacuum melted superalloys.

2. The panel expressed strong support for a pilot program to confirm current industrial practice on chemical purification technology as a means to provide suitable feedstock from pre-1980 stockpile cobalt for production of extra fine powder by the Carolmet process.

3. Industry representatives on the panel offered to conduct the pilot program on extra fine powder at no cost to the government including provisions to replace the stockpile cobalt required for the test. Hall Chemical Co. proposed to prepare a solution of pre-1980 cobalt purified to meet all specifications required by Carolmet for production of extra fine powder. The evaluation cycle would be completed by Carboloy Div. by manufacturing and testing carbide cutting tools from the experimental powder.

4. The panel concurred that powder produced from chemically purified solutions, suitably compacted and packaged to prevent pickup of oxygen and nitrogen, presents a promising alternative for upgrading pre-1980 cobalt to grade 1 quality suitable for vacuum superalloy applications. Strong support was expressed for a pilot program to evaluate this option.

5. A Technical Advisor to the panel from GTE Products Corp. reported that the company has technology and a manufacturing facility in operation to convert the pre-1980 cobalt to high purity powder. The company has been supplying extra fine cobalt powder to the cemented carbide industry for the last five years using secondary sources as feedstock and the panel feels that this established technology can utilize pre-1980 stockpile cobalt without the need for a pilot test. However, a pilot program was suggested by the panel to evaluate existing GTE chemical refining technology for pre-1980 stockpile cobalt, followed by reduction to powder and compaction, as a source of grade 1 cobalt for vacuum melted superalloys. Howmet Turbine Components Corp. offered facilities to evaluate the powder compacts for manufacture of vacuum melted superalloys.

Recommendations:

1. Accept industry's offer to conduct pilot tests on the utilization of existing chemical processing technology to refine pre-1980 stockpile cobalt as feedstock for extra fine powder and for production of grade 1 cobalt powder compacts for superalloys. Arrangements should be expedited to release experimental quantities of contract 331 cobalt in exchange for specification grade cobalt from industry, to provide for pilot experiments as follows:

   a) Release 100 lb of cobalt from contract 331 to Hall Chemical Co., in exchange for the same amount of specification grade cobalt. Hall Chemical Co. will prepare a cobalt chloride solution to specification of Carolmet Inc. which will manufacture extra fine powder in its regular production facilities. This product will be supplied to Carboloy Division, General Electric Co., for manufacture of cemented carbide tools for comparative testing.

   b) Release 100 lb of cobalt from contract 331 to GTE Products Corp. in exchange for the same amount of specification grade cobalt. GTE will apply its established manufacturing technology on a pilot scale to upgrade the cobalt by chemical means, followed by reduction to powder and compaction. The compacts will be delivered to Howmet Turbine Components Corp. for evaluation in the manufacture of vacuum melted superalloys.

2. Make larger scale runs utilizing full production quantities after the experimental pilot tests. GTE suggested a 5,000 to 10,000 lb run to produce powder compacts for vacuum melted superalloys.

3. Appraise the constraints on capacity of the chemical processing industry to provide the quantities of extra fine powder needed in a national emergency utilizing pre-1980 cobalt. Likewise, assess the requirements for chemical processing equipment to provide adequate quantities of grade 1 cobalt powder compacts for superalloys.

4. Test the stability of extra fine cobalt powder under stockpile storage conditions utilizing sealed containers under an inert and pressurized atmosphere. If deterioration occurs, the feasibility of restoring properties should be investigated. Likewise, run tests to determine packaging and storage procedures required to prevent pickup of oxygen and nitrogen by the powder compacts.

F. Metallurgical Processing Technology to Upgrade Pre-1980 Stockpile Cobalt.

Summary of Findings:

1. The panel noted that the specialty metals industry utilizes a variety of metallurgical processing systems for production of stainless steels and specialty metals. The consensus was that this existing melting and refining technology and industry know-how could be applied effectively for preprocessing the pre-1980 cobalt to grade 1 quality for vacuum melted superalloys.

2. It was proposed that pilot tests be conducted utilizing existing specialty metals processing technology including AOD (argon-oxygen decarburization), ESR (electroslag refining), EB (electron beam), VIM (vacuum induction melting), and VAR (vacuum arc refining). Precise chemical analysis is required of the charge of stockpile cobalt and following each significant step in the refining experiments. Likewise, the composition of the refined cobalt will be compared with the specification for grade 1 quality.

3. With the exception of the AOD process, facilities are available to conduct experimental pilot tests suggested above using relatively small quantities of pre-1980 stockpile cobalt. However, investigations revealed that the smallest AOD facility available for pilot evaluation is a unit that can process 4,000 pounds at Howmet Turbine Components Corp.

4. A Technical Advisor to the panel representing Ames Metals Development Laboratory offered the use of the metallurgical processing facilities at the laboratory for experimental pilot studies on refining pre-1980 stockpile cobalt. Experimental tests proposed at no cost to the stockpile program include ESR, EB, VIM, and VAR utilizing samples of the order of 10 pounds for each test involving variations in processing conditions, with precise analytical measurements before and after each experimental melt.

5. The viewpoint of the panel was that the AOD process offered the most promising and practical method of preprocessing the pre-1980 cobalt to a quality level that could be used for production of vacuum melted superalloys. Even though larger quantities of cobalt are required than for experimental pilot studies, the panel urged that provisions be made for the pilot AOD test, followed by a larger scale run.

Recommendations:

1. Accept the panel's assessment that the industrial technology existing in the various melting and refining systems for the production of

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stainless and specialty steels offers a promising and practical approach for preprocessing the pre-1980 stockpile cobalt to quality levels required for critical applications in vacuum melted superalloys. Likewise, evaluate the various metallurgical processing systems to determine the most effective system for preprocessing stockpile cobalt.

2. Expedite the release of 100 pounds of contract 331 cobalt to Ames Metals Development Laboratory, in exchange for specification grade cobalt, for experimental pilot tests utilizing 10 pound samples. Melting experiments will include the following: (a) electroslag refining (ESR) - three melts; (b) electron beam refining (EB) - two melts; (c) vacuum induction melting (VIM) - two melts; (d) vacuum arc refining (VAR) - two melts. It is intended that the Ames experiments will include precise chemical analyses for all elements in the specification for grade 1 quality to provide a basis for evaluating the relative effectiveness of the melting experiments in upgrading the quality of the pre-1980 cobalt and also to assist in planning trials in large scale industrial facilities.

3. Expedite the release of 4,000 pounds of contract 331 cobalt to Howmet Turbine Components Corp. for pilot evaluation of AOD refining. The consolidated charge should be analyzed following melt down in the electric furnace. Samples for analyses should be taken when the molten cobalt is transferred to the AOD vessel, when tapped from the vessel, and at other appropriate times. The analyses should include all elements identified in the specification for grade 1 quality.

4. Evaluate and document the efficiency of removal of undesirable elements to meet the requirements for grade 1 cobalt in the Ames experiments and in the AOD pilot test. The panel strongly recommended that follow-up tests of the most efficient preprocessing treatments be conducted in production facilities.

5. Compile, under high priority status, specific information on proven metallurgical refining procedures that could be used immediately by industry in an emergency for preprocessing pre-1980 stockpile cobalt to grade 1 quality required for production of vacuum melted superalloys. This would provide direction for an action plan if a national emergency should arise before adequate quantities of grade 1 cobalt are made available either through procurement or by refining the pre-1980 cobalt.

Chapter 3

Description of Stockpile Cobalt Inventory

Accumulation of the current cobalt inventory of the National Defense Stockpile stems from enactment of the Strategic and Critical Materials Stockpiling Act of 1946 (Public Law 520). Purchase of cobalt began in the late 1940's and continued into 1961. Cobalt was sold from the stockpile during the period 1962-1978. Subsequently, the first purchase in 20 years was in 1981-82 during which 5.2 million pounds were added to the stockpile. Table 3-1 indicates the amount of stockpiled cobalt at year-end for the period 1950-1980. Thus, the current inventory contains 40.8 million pounds of cobalt purchased some 25 years ago (designated as pre-1980 cobalt) and 5.2 million pounds purchased after 1980.

Table 3-1. National Defense Stockpile Cobalt Metal Year End Inventories 1950 - 1980

Year	Contained cobalt, lb
1950	14,353,445
1951	17,722,429
1952	20,455,443
1953	30,618,246
1954	42,376,170
1955	53,509,827
1956	62,118,026
1957	71,310,199
1958	87,202,000
1959	97,099,000
1960	103,235,000
1961	103,260,000
1962	103,120,000
1963	102,932,000
1964	102,199,000
1965	102,199,000
1966	101,437,512
1967	95,249,020
1968	90,295,595
1969	84,289,302
1970	78,272,666
1971	77,345,269
1972	68,175,127
1973	60,123,614
1974	50,797,947
1975	45,897,392
1976	40,893,169
1977	40,802,943
1978 - 1980	40,802,393

Note: This chapter is based on a presentation made to the ASM Panel by members of the government liaison group.

Most of the material purchased during 1947-1961 came from South Africa, Zaire, Canada, and Zimbabwe. The cobalt is in the following forms: rondelles, granules, briquettes, cones and miscellaneous. Most of this material is in the form of rondelles and large granules.

In March 1981, President Reagan announced that the National Defense Stockpile was to be reconstituted to bring it up to date and that cobalt was selected as the first material of which additional purchases would be made. As a result, 5.2 million pounds of electrolytic broken-cathode cobalt was purchased during 1981-1982. This material came from Zaire.

Storage

The cobalt inventory is stored in wooden boxes, casks, steel drums, barrels, and cans under closed storage conditions in government depots in 11 eastern and midwestern cities. Table 3-2 shows the amount of pre-1980 metal in the form of rondelles and granules stored at each location, the number of lots, and range of the number of containers for these lots. About 177,000 pounds of cobalt in the form of briquettes are stored in 450 steel drums at the Hammond, Indiana depot.

The post-1980 cobalt consists of approximately 79 lots having an average weight of 66,139 pounds. Each lot of metal is in 120 steel drums and is stored at the Casad depot in New Haven, Indiana, and Warren, Ohio. Although the specification required galvanized drums, a modification of the contract was released by the government to permit shipping and storing in ungalvanized drums to preclude zinc contamination of the cobalt.

Most of the storage containers of the pre-1980 cobalt are identified by lot number and other information. Such identification is attached to the outside of the container. The post-1980 material is identified both inside and outside as required by specification.

Table 3-2. Storage Details for Cobalt Rondelles and Granules Purchased Before 1980

Storage location	Total weight, lb	Number of lots	Number of containers
Binghamton, NY	1,754,845	52	2 to 200
New Haven, IN	12,536,552	407	2 to 150
Curtis Bay, MD	1,136,473	3	1,452; 440; and 400
Point Pleasant, WV	1,633,328	42	4 to 692
Davisville, RI	1,222,298	132	10 to 150
Mechanicsburg, PA	1,410,595	41	2 to 500
Ravenna, OH	4,548,864	156	4 to 267
Scotia, NY	4,275,343	121	7 to 440
Seneca, NY	113,104	3	62
Somerville, NJ	6,480,509	418	10 to 150
Warren, OH	5,413,046	186	2 to 194
TOTAL	40,524,957	1,561	

Specifications

The pre-1980 material was purchased under various specifications that identified the minimum content of cobalt required and the maximum amounts of six undesirable elements, namely, nickel, iron, carbon, copper, sulfur, and phosphorus, as shown in Table 3-3. The 1949 and 1951 specifications were equivalent with respect to chemical content. The specification was altered in 1972 to raise the minimum content of cobalt to 99.7% and to greatly reduce the maximum content of undesirable elements, as indicated in Table 3-4. No material was purchased under the 1972 specification P-13-R2. The pre-1980 cobalt was purchased under the 1949, 1951, 1953 and 1957 specifications.

Another revision was effected in 1980 to further reduce the content of the six undesirable elements previously identified and to identify 11 other undesirable elements and the maximum content of each. However, no cobalt was purchased under this specification, P-13-R3 (Table 3-5).

It became apparent that composition for broken cathode cobalt specified in P-13-R3 was unduly restrictive on certain undesirable elements such as iron, manganese, copper, silicon, carbon, hydrogen, nitrogen, antimony, and phosphorus. Consequently, specification P-13-R4 (Table 3-6) was developed after input from several high temperature alloy producers and coordination with the Tool and Stainless Steel Industry Committee (TSSIC).

Table 3-3. Composition Limits of National Stockpile Purchase Specifications Effective 1949-1957

Element	1949	1951	1953	1957
	Max % by weight			
Cobalt (Co)	97.00 min	97.00 min	97.00 min	97.00 min
Nickel (Ni)	0.75	0.75	0.75	0.75
Iron (Fe)	0.30	0.30	0.30	0.30
Carbon (C)	0.50	0.50	0.50	0.50
Copper (Cu)	0.10	0.10	0.10	0.10
Sulfur (S)	0.05	0.05	0.05	0.05
Phosphorus (P)	(a)	(a)	0.02	0.02

(a) A limit for phosphorus was not specified.

Table 3-4. Composition Limits of National Stockpile Purchase Specification P-13-R2 (1972) (a)

Element	Max % by weight
Cobalt (Co)	99.7 min
Nickel (Ni)	0.2
Iron (Fe)	0.02
Carbon (C)	0.03
Copper (Cu)	0.02
Sulfur (S)	0.01
Phosphorus (P)	0.01

(a) Prepared and issued by the Industrial Resources Division, Bureau of Domestic Commerce, U.S. Department of Commerce.

P-13-R4 specifies the chemical requirements for two grades of electrolytic broken cathode cobalt and that for cobalt granules. Five additional undesirable elements - tin, selenium, silver, zinc, and cadmium - are identified for the electrolytic material. All of the post-1980 cobalt was purchased under the requirements of P-13-R4 grade B material.

The revisions in the specifications adopted in 1980 and 1981 were the result of advancing technology and recognition of the deleterious effects of undesirable trace elements on the performance of rotating cobalt-containing aircraft jet engine parts subjected to high temperature and high stress environment. Recent testing and analyses of these parts indicate that three other undesirable trace elements - thallium, tellurium and mercury - should be included in the specification. The ASM panel recommends this change and included appropriate limitations in developing the specification for grade 1 cobalt.

Purchasing Requirements

Current practice requires that cobalt be purchased on a lowest-bid basis from one or more qualified suppliers. The purchase contract specifies that each lot shipped be a production lot, i.e., the material comprising a specific lot is from a single production electrolysis batch operation.

All the post-1980 cobalt lots meet the production lot criterion. The 5.2 million pounds of cobalt was purchased from Societe Zairoise de Commercialisation de Minerals (SOZACOM) and shipped under the control of SOZACOM directly from the electrolytic cathode production facility to the United States.

Table 3-5. Composition Limits of National Stockpile Purchase Specification P-13-R3 (1980) for Two Forms of Cobalt (a)

Element	Broken Cathodes	Granules
	Max % by weight	
Cobalt (Co)	99.90 min	99.50 min
Nickel (Ni)	0.040	0.15
Iron (Fe)	0.004	0.14
Manganese (Mn)	0.0007	0.013
Copper (Cu)	0.0015	0.015
Lead (Pb)	0.0003	0.001
Zinc (Zn)	0.0030	0.005
Silicon (Si)	0.0010	0.025
Aluminum (Al)	------	0.030
Sulfur (S)	0.0010	0.007
Carbon (C)	0.0050	0.010
Hydrogen (H_2)	0.0003	0.001
Oxygen (O_2)	0.0070	0.030
Bismuth (Bi)	0.0001	0.0001
Arsenic (As)	0.0010	0.0010
Nitrogen (N_2)	0.0005	0.0005
Antimony (Sb)	0.0001	------
Phosphorus (P)	0.0005	------

(a) Published by U.S. Department of Commerce with approval of Federal Emergency Management Agency.

Current records do not indicate whether the production lot criterion existed for the pre-1980 cobalt. Therefore, it is not known whether the chemical analyses of record are fully representative. This factor and the wide variation of lot sizes and number of containers, as indicated in Table 3-2, compound the problem in developing a plan for obtaining representative samples to assess the quality of the material.

Sampling and Analyses

There are no records of the sampling procedures and analyses techniques used to determine the acceptability of the pre-1980 cobalt. It is assumed that chemical analyses were primarily by wet methods because current methods were either unknown or in their embryo stage of development. Table 3-7 shows a sample of analysis report from a supplier; note the inclusion of percentage content for calcium oxide (CaO), silicon dioxide (SiO_2), and manganese (Mn) which were not required by the purchase specification. Table 3-8 shows a sample of analysis report prepared by the U.S. Customs Laboratory for an incoming shipment.

Upon delivery and acceptance of a shipment of material whose composition and form meet the purchase specification, the analysis conducted by the government's

Table 3-6. Composition Limits of National Stockpile Purchase Specification P-13-RA (1981) for Two Forms of Cobalt (a)

Element	Electrolytic broken cathodes Grade A	Grade B	Granules
	Max % by weight		
Cobalt (Co)	99.90 min	99.65 min	99.50 min
Nickel (Ni)	0.040	0.30	0.15
Iron (Fe)	0.004	0.01	0.14
Manganese (Mn)	0.0007	0.001	0.013
Copper (Cu)	0.0015	0.002	0.015
Lead (Pb)	0.0003	0.0005	0.001
Zinc (Zn)	0.0030	0.003	0.005
Silicon (Si)	0.0010	0.005	0.025
Aluminum (Al)	------	0.01	0.030
Sulfur (S)	0.0010	0.001	0.007
Carbon (C)	0.0050	0.01	0.010
Hydrogen (H_2)	0.0003	0.001	0.001
Oxygen (O_2)	0.0070	0.007	0.030
Bismuth (Bi)	0.0001	0.0001	0.0001
Arsenic (As)	0.0010	0.0010	0.0010
Nitrogen (N_2)	0.0005	0.010	0.0005
Antimony (Sb)	0.0001	0.0005	------
Phosphorus (P)	0.0005	0.005	------
Tin (Sn)	0.001	0.001	------
Selenium (Se)	0.0005	0.0005	------
Silver (Ag)	0.0005	0.0005	------
Zinc plus cadmium (Zn + Cd)	0.004	0.004	------

(a) Published by U.S. Department of Commerce with approval of Federal Emergency Management Agency.

designated laboratory becomes the analysis of record. In general, it has been the government's policy not to reanalyze or reevaluate most of the 91 different materials after each shipment was accepted for the National Defense Stockpile.

In 1981, however, the Quality Assurance Division of GSA established a new program to evaluate materials in the stockpile. Lack of funds and personnel limited the first program to an evaluation of four materials selected on the basis that (1) the material was subject to deterioration, or (2) it may have become contaminated, or (3) it was of unknown quality or the quality had not been previously established by government analysis. Cobalt was one of the four materials selected for reevaluation.

A reference standard was developed with the aid of TSSIC to facilitate evaluation of laboratories for analyzing cobalt. This standard was developed from grab samples taken from the top of 16 storage drums of a 126-drum lot and from three drums of a 26-drum lot. The cobalt in both lots was received in 1953. The standard was developed by the laboratories of three high-temperature alloy producers (Special Metals Corporation, Universal Cyclops Specialty Steel Division and Carpenter Technology Corporation) and Vac Air Alloys Corporation.

Table 3-9 compares the composition of the two lots as analyzed in 1953 and again in 1982. The latter analyses were expanded to determine the content of all elements identified by P-13-R4 grade B material. The latest analyses indicate close confirmation of the 1953 results for the six undesirable elements; differences between the 1953 and 1982 analyses may be the result of two different analytical methods.

Table 3-7. Certification of Composition of a Shipment of Cobalt Delivered to the Stockpile in 1947

ANALYSIS CERTIFICATE

366 barrels of Cobalt Metal Rondelles

Marks: COBALT METAL
No. 841/1206
Lot No. 1/6
Made in Belgium
African Metals Corporation
S.C.M. - T.P.S. - 42910
Treasury Department
Procurement Division

Gross weight: 192,099 lb
Tare: 9,099 lb
Net weight: 183,000 lb

	Co	Ni	CaO	SiO_2	Fe	Mn	Cu	S	C
Lot No. 5 Barrels: C81/1140	98.35	0.44	0.15	0.144	0.14	0.05	0.01	0.027	0.16

Brussels, September 5th, 1947
Certified correct,
UNION MINIERE DU HAUT KATANGA
Cobalt Department

Table 3-8. U.S. Customs Laboratory Report
Of Analyses for Five Lots of Cobalt Delivered in 1948

TREASURY DEPARTMENT

LABORATORY REPORT

Lab. No. _____

U. S. CUSTOMS LABORATORY

New York, N. Y., 4/20/48, 19__

Sample(s) of COBALT METAL — Received 4/7/48

Submitted by Inspection Div., Standards Branch, Bureau of Federal Supply — Port 50 Church St. New York 7, N. Y.

Entry No. 8CU-TBS-78244 Marks Lots 40/44 P & O Nos. 1 & Origin _____

Importer _____ Maker _____

Other Data _____

Information required As in accordance with specifications ?

REPORT

The samples of cobalt have the following analyses:

123-75312 123-75258 124-75258. 124-75275 60-36800

	Lot L07 & L09	Lot L17 & L19	Lot L27 & L29	Lot L37 & L39	Lot L47 & L49
Cobalt	98.85%	98.97%	98.77%	98.99%	98.71%
Nickel	0.72%	0.60%	0.62%	0.51%	0.56%
Iron	0.21%	0.20%	0.24%	0.23%	0.26%
Carbon	0.14%	0.13%	0.28%	0.14%	0.20%
Copper	0.03%	0.03%	0.02%	0.02%	0.02%
Sulphur	0.02%	0.03%	0.03%	0.02%	0.02%

They conform to ANC3 Specifications P-13.

M. Gallant
V. Dumas
V. Dumas

L. Schnopper, Actg. Asst. Chief Chemist.

The statistical sampling plan for the post-1980 cobalt shipments consisted of randomly selecting 32 drums from each lot, weighing each of the full drums, dumping the contents of each into a hopper, weighing each of the empty drums, releasing the material and taking a sample by cutting the stream of the material as it flowed into a new drum. This procedure provided a gross sample weighing 85 to 100 pounds from the 32 drums. Subsequently, the gross sample was riffled into a 10 pound sample for the umpire laboratory and into three samples of four pounds each - one for the GSA contract laboratory, one for the SOZACOM laboratory, and one held as a reserve.

All of the cobalt purchased after 1980 was analyzed by Princeton Testing Laboratory under contract with GSA. Table 3-10 shows the representative analysis for one of the lots. Chemical analyses of cobalt purchased under specification P-13-R4 are difficult to accomplish because of the low content of undesirable elements permitted. Instrumental techniques are required for most of these analyses. The less than symbol (<) indicates that the content of the specific element was less than the detectable level which is the amount indicated. Note that this cobalt, which is from Zaire, does not contain detectable amounts of lead, bismuth, antimony, phosphorus, tin, selenium, or silver.

Table 3-9. Composition of Two Lots of Cobalt Received In 1953 and Reanalyzed in 1982

Element	Purchase Specification P-13-R4 (1981) Grade B Max % by weight	Lot A 1953	Lot A 1982	Lot B 1953	Lot B 1982
		% by weight			
Cobalt (Co)	99.65 min	99.21	99.42	99.81	99.29
Nickel (Ni)	0.30	0.26	0.26	0.18	0.26
Iron (Fe)	0.01	0.10	0.14	0.10	0.16
Manganese (Mn)	0.001	-	0.053	-	0.075
Copper (Cu)	0.002*	0.01	0.023	-	0.019
Lead (Pb)	0.0005	-	0.00011	-	0.00038
Zinc (Zn)	0.003	-	0.0041	-	0.0160
Silicon (Si)	0.005	-	0.043	-	0.060
Aluminum (Al)	0.01	-	0.0028	-	0.015
Sulfur (S)	0.001	0.03	0.026	0.02	0.029
Carbon (C)	0.01	0.02	0.007	0.04	0.056
Hydrogen (H_2)	0.001	-	-	-	-
Oxygen (O_2)	0.007*	-	0.0030	-	0.0030
Bismuth (Bi)	0.0001	-	0.00003	-	0.00002
Arsenic (As)	0.0010	-	0.0002	-	0.0002
Nitrogen (N_2)	0.010	-	0.0010	-	0.0008
Antimony (Sb)	0.0005	-	0.0007	-	0.0007
Phosphorus (P)	0.005	0.01	0.007	-	0.0046
Tin (Sn)	0.001	-	0.0003	-	0.0003
Selenium (Se)	0.0005	-	0.000016	-	0.000013
Silicon (Ag)	0.0005	-	0.0001	-	0.0001
Zinc + cadmium (Zn + Cd)	0.004	-	0.0044	-	0.0163

*Federal Emergency Management Agency letter (27 Jan. 1982) approved 0.004% max copper and 0.015% max oxygen.

Testing Laboratories

Government regulations specify that the laboratory for analyzing stockpile material be selected on the basis of the lowest priced qualified bidder. Qualification criteria are previous analytical experience with government material, a capability for performing the required analyses, and identification and availability of specific analytical equipment and procedure to be used. Princeton Testing Laboratory was awarded a contract to analyze the incoming shipments of the 5.2 million pounds of cobalt of 1981 and 1982. Analysis of the cobalt was to be effected by the Leco Detector and by atomic absorption procedures. GSA required that the laboratory identify the procedure to be used and the detectable levels for the undesirable trace elements prior to the analysis.

GSA purchase contract requirements specified that an umpire laboratory, selected by mutual agreement between GSA and the supplier of the material, be used for verifying the laboratory analysis if it was out of specification for a particular lot. Concurrance by the umpire laboratory rendered the lot unacceptable and the supplier was responsible for replacement of the lot. Table 3-11 shows the chemical analysis for lot 83 reported by the supplier's laboratory and Table 3-12 gives the results of analysis by the contract laboratory.

Table 3-10. Composition of One Lot of Post-1980 Cobalt Compared to the Purchase Specification

Element	Post-1980 cobalt, % by weight	Purchase specification P-13-R4, Grade B Max % by weight
Cobalt (Co)	>99.90	99.65 min
Nickel (Ni)	0.042	0.30
Iron (Fe)	0.0030	0.01
Manganese (Mn)	0.0002	0.001
Copper (Cu)	0.0025	0.002*
Lead (Pb)	<0.0001	0.0005
Zinc (Zn)	0.0021	0.003
Silicon (Si)	0.0012	0.005
Aluminum (Al)	0.0009	0.01
Sulfur (S)	0.001	0.001
Carbon (C)	0.006	0.01
Hydrogen (H_2)	0.0004	0.001
Oxygen (O_2)	0.013	0.007*
Bismith (Bi)	<0.00005	0.0001
Arsenic (As)	0.00003	0.0010
Nitrogen (N_2)	0.001	0.010
Antimony (Sb)	<0.0001	0.0005
Phosphorus (P)	<0.0001	0.005
Tin (Sn)	<0.0001	0.001
Selenium (Se)	<0.0001	0.0005
Silver (Ag)	<0.0001	0.0005
Zinc + cadmium (Zn + Cd)	0.0017	0.004

*Federal Emergency Management letter (27 Jan. 1982) approved 0.004% max copper and 0.015% max oxygen.

The contract laboratory analysis, subsequently verified by the umpire laboratory, indicated that the oxygen and copper contents in each of the first 10 lots of post-1980 cobalt shipments were greater than the maximum limits permitted. The 0.007 percent maximum oxygen stated in specification P-13-R4 Grade B applied to the content measured soon after production of the cobalt. However, GSA and industry found that the oxygen content increased as a result of oxide film formed during shipping and storage. Therefore, a deviation for a level of 0.015 percent maximum oxygen was requested. The deviation also increased the copper content to 0.004 percent maximum. GSA accepted these lots after the Federal Emergency Management Agency (FEMA) issued deviations in January 1982 for these and subsequent lots comprising the 5.2 million pounds being purchased. Table 3-10 indicates the representative analysis for these lots and the higher copper and oxygen levels approved by FEMA.

Table 3-11. Composition of One Lot of Post-1980 Cobalt Analyzed by Supplier's Laboratory (a)

Element	% by weight
Cobalt	99.90
Nickel	0.06
Iron	0.004
Manganese	0.0003
Copper	0.002
Lead	0.0003
Zinc	0.002
Silicon	0.001
Aluminum	0.0001
Sulfur	0.001
Carbon	0.008
Hydrogen	0.0003
Oxygen	0.007
Bismuth	0.0001
Arsenic	0.001
Nitrogen	0.001
Antimony	0.0001
Phosphorus	0.001
Tin	0.001
Selenium	0.0002
Silver	0.0001
Zinc + cadmium	0.003

(a) Broken cathodes identified as lot no. 83 analyzed by Central Laboratories on behalf of La Generale des Carrieres et des Mines, Lubumbashi, Zaire, in 1982.

Table 3-12. Report of Contract Laboratory on Composition of One Lot of Post 1980 Cobalt

princeton testing laboratory

DATE: November 22, 1982

JOB NO. 23350

General Services Administration
Office of Stockpile Management
18th and F Street, NW Room 5218
Washington, DC 20405
ATT: Quality Assurance Division

AUTHORIZATION: PO# M21976553

SAMPLE: cobalt - 1

REPORT OF ANALYSIS

Cobalt - Broken Cathodes
GSA Lot #3
Government Sample #83 - REPLACEMENT
Societe Zairoise de Commercialisation de Minerals
GSA/FPRS - Casad Depot - New Haven, IND
Contract # GS-00--DM(S)-82004
Sales Contract #GS-D00xx-81C-0001

	Concentration, %
Cobalt	99.88
Nickel	.030
Iron	.0013
Manganese	.0002
Copper	.0022
Lead	< .0001
Zinc	.0008
Silicon	.0012
Aluminum	.0010
Sulfur	.002
Carbon	< .01
Hydrogen	< .0005
Oxygen	.0072
Bismuth	< .00005
Arsenic	< .00003
Nitrogen	.0006
Antimony	< .0001
Phosphorus	< .0001
Tin	< .0001
Selenium	< .0001
Silver	< .0001
Zinc and Cadmium	.0008

Ronald McCloskey, Manager
Inorganic Laboratory

:clp

Inventory Records

Pertinent information on each shipment of cobalt is contained in the master inventory file which includes the following:

1. Identification of material stored
2. Type of storage container
3. Form of material
4. Location of storage depot
5. Agency of depot ownership and storage environment
6. Purchase contract number and lot numbers
7. Date of receipt of material (not available for pre-1980 cobalt)
8. Receiving report number
9. Class of material (National Defense Stockpile or other)
10. Specification grade
11. Number of storage units in lot
12. Bulk weight
13. Weight of contained cobalt
14. Chemical composition

Inventory records for the post-1980 cobalt are complete. Some records for the pre-1980 cobalt are not available.

Chapter 4

Quality Requirements for Specific Applications

A. General Considerations

The pre-1980 cobalt is not satisfactory for production of vacuum melted nickel base and cobalt base superalloys and can not be relied upon for other critical applications.

The various defense and industrial uses for cobalt do not require the same degree of quality to meet performance requirements. Thus it appeared appropriate to define the quality levels required in terms of use classes, designated as grade 1, grade 2, and grade 3, and develop composition limits for specifications to conform to end use requirements for each grade. The definition of grades to meet performance requirements for the various applications are given below:

DEFINITIONS OF GRADES OF COBALT
FOR THE NATIONAL DEFENSE STOCKPILE

Grade 1 Cobalt - Composition required is most critical for the following applications: nickel base and cobalt base vacuum processed superalloys for aircraft jet engines; extra fine powder for cemented carbides (see note); corrosion-resistant vacuum grade alloys; low-nickel and high cobalt (over 25%) magnetic and electronic alloys; vacuum-melted high strength steels; and medical implant alloys.

(NOTE: Grade 1 cobalt is not required for the chemical process used in producing extra fine powder by the GTE process. Cobalt with tighter limits on certain elements than is specified for grade 1 is currently required as feedstock for the chemical process used by Carolmet Inc; special quality cobalt may not be required depending on the results of a recommended pilot study employing a refined chemical solution as feedstock for this manufacturer. Extra restrictions on nickel may be required in grade 1 for certain high cobalt magnetic alloys.)

Grade 2 Cobalt - Composition required is less critical for the following applications: air melted corrosion-resistant alloys; air melted high strength ferrous alloys; magnetic and electronic alloys containing less than 20-25% cobalt; air melted nickel base and cobalt base superalloys; hard facing alloys.

Grade 3 Cobalt - Composition required is least critical; pre-1980 stockpile cobalt is suitable for the following applications: air melted tool steels and products of the chemical industry, including catalysts, dryers, and frits. The chemical industry has technology in place for purifying any quality level of cobalt including secondary materials.

The panel established composition limits for grade 1 and grade 2 cobalt. The pre-1980 cobalt inventory was designated as grade 3.

All of the 5.2 million pounds of cobalt recently purchased, which was analyzed for 22 elements, is of quality that can be used to produce vacuum melted nickel base and cobalt base superalloys for military and commercial jet engines and is suitable for the production of extra fine cobalt powder by the Carolmet process.

A number of factors including industry's processing practices in addition to end product performance requirements were considered in arriving at the composition limits for grade 1 and grade 2 (Table 2-1). These factors are discussed in the sections which follow.

However, it should be noted that the detrimental effects of undesirable trace elements on performance of end products and problems with sulfur, carbon, and phosphorus received strong considerations in developing the specifications. These constituents disqualify the pre-1980 stockpile cobalt for grade 1 critical applications.

The appropriate composition limit for nickel received a lot of consideration. Finally, the panel concurred that the composition limit for nickel in grade 1 should be changed from 0.15% max included in the early stages of the specifications development to 0.50% max. Even this, as one panel member stated, is two or three times lower than would be required for producing the nickel base and cobalt base vacuum melted superalloys. The viewpoint of the panel was that it is unduly restrictive to hold to an unnecessarily low level of nickel for the major application of cobalt in superalloys realizing that it is beyond the limits specified for extra fine powder by the Carolmet process, and for certain high cobalt magnetic alloys.

In considering composition limits for specifications, the panel recognized that the requirements for cobalt quality for future use will likely be more stringent than those for current technology. This concept resulted in a general tightening of limits for undesirable elements during the panel deliberations on specifications especially for grade 1 applications.

B. Quality Requirements for Superalloys for Aircraft Jet Engines

Cobalt is used in alloys for jet aircraft engines where resistance to high temperature under conditions of high stress is required. Most superalloys for this application are nickel base, containing 10 to 20% cobalt, while a few alloys are cobalt base, containing 40 to 60% cobalt.

Aircraft jet engines require cobalt of extremely high purity. The new generation of high thrust-to-weight jet engines may increase the requirements on purity limits especially for high temperature rotating parts.

Trace Elements - One of the significant technical developments, disclosed by the panel, that will disqualify the pre-1980 cobalt for aircraft engine superalloys, is recognition of the detrimental effects of very small quantities of trace elements. In amounts of 0.5 to 5 parts per million (ppm), the most deleterious elements are selenium (Se), lead (Pb), tellurium (Te), thallium (Tl), bismuth (Bi), and mercury (Hg).

General Electric Company and the Pratt & Whitney Aircraft Group have established maximum limits for most of the above trace elements as indicated below:

	General Electric Co. % max	Pratt & Whitney (a) % max
Bismuth	0.00005 (½ppm)	0.00005
Thallium	0.0001 (1ppm)	0.00005
Tellurium	0.0001 (1ppm)	0.00005
Lead	0.0005 (5ppm)	0.0005
Selenium	0.0005 (5ppm)	0.0001
Silver	0.0005 (5ppm)	------

(a) Includes maximum acceptable amounts for directional and single crystal airfoils.

The five critical trace elements (or six, although it's unlikely that silver will be encountered) have a major adverse effect on high temperature creep/rupture ductility and life of the part when present in amounts above the maximum limit plus the margin of analytical uncertainty. These elements migrate to the grain boundaries resulting in embrittlement of the alloy due to reduced grain boundary ductility. Embrittlement can cause cracking during processing and has a detrimental effect on performance by reducing elevated temperature strength and ductility. Although tensile properties of the alloy may be satisfactory, stress rupture life and ductility are reduced.

The panel noted that problems with levels of sulfur, carbon and phosphorus in the pre-1980 stockpile cobalt may be more serious than those with undesirable trace elements. One consideration is that the vacuum induction melting process used for production of superalloys is not effective in removing these elements. The specification for carbon for the production of single crystal blades is 50 ppm.

Melters Responsibilities - Users of aircraft engine parts emphasized that their material control systems rely on superalloy melters to exercise expertise and diligence in controlling trace element levels and other undesirable constituents through their internal systems of raw material specifications.

The specifications presented to the panel by Howmet Turbine Components Corporation cover wrought and cast alloys and powders for use in "Gatorizing." Raw material specifications for vacuum grade cobalt and for air melt cobalt are given in Table 4-1.

Howmet noted that air melt allows higher maximum quantities of the specified undesirable elements than does the vacuum grade. However, about the only uses of air melt grades are for stationary gas turbine parts and replacement parts for old aircraft engines. Current aircraft engines require vacuum grade cobalt.

29-560 O—84——4

Table 4-1. Raw Material Specification for Cobalt Used by Howmet Turbine Components Corporation to Produce Superalloys

Element		Composition of cobalt: Vacuum melted alloys, % max	Air melted alloys, % max
Cobalt	(Co)	99.5 min	99.5 min
Carbon	(C)	0.01	0.020
Silicon	(Si)	0.003	0.020
Phosphorus	(P)	0.001	0.005
Sulfur	(S)	0.001	0.010
Iron	(Fe)	0.010	0.20
Lead	(Pb)	0.001	0.001
Selenium	(Se)	0.0005	0.0005
Bismuth	(Bi)	0.00005	0.001
Copper	(Cu)	0.004	0.020
Zinc	(Zn)	0.010	0.010
Nickel	(Ni)	0.10	0.400
Hydrogen	(H_2)	0.0003	0.0005
Nitrogen	(N_2)	0.001	0.001
Oxygen	(O_2)	0.010	0.0250
Manganese	(Mn)	-----	0.015
Aluminum	(Al)	-----	0.060
Cadmium	(Cd)	-----	0.0002
Tin	(Sn)	-----	0.0005

Table 4-2. Raw Material Specification for Cobalt Used by Cannon-Muskegon Corporation to Produce Vacuum Melted Alloys Compared with Government Specification P-13-R4

Element	C-M specification % max	P-13-R4 specification Grade A % max	Grade B % max
Cobalt (Co)	99.0 min	99.90 min	99.65 min
Nickel (Ni)	0.8	0.040	0.30
Iron (Fe)	0.15	0.004	0.01
Manganese (Mn)	0.01	0.0007	0.001
Copper (Cu)	0.0060	0.0015	0.002
Lead (Pb)	0.0015	0.0003	0.0005
Zinc (Zn)	0.0050	0.0030	0.003
Silicon (Si)	0.02	0.0010	0.005
Aluminum (Al)	0.02	------	0.01
Sulfur (S)	0.0040	0.0010	0.001
Carbon (C)	0.0100	0.0050	0.01
Hydrogen (H_2)	0.0002	0.0003	0.001
Oxygen (O_2)	0.0100	0.0070	0.007
Bismuth (Bi)	0.0001	0.0001	0.0001
Arsenic (As)	0.0010	0.0010	0.0010
Nitrogen (N_2)	0.0010	0.0005	0.010
Antimony (Sb)	0.0005	0.0001	0.0005
Phosphorus (P)	0.0020	0.0005	0.005
Tin (Sn)	------	0.001	0.001
Selenium (Se)	0.0005	0.0005	0.0005
Silver (Ag)	0.0005	0.0005	0.0005
Zinc + cadmium (Zn + Cd)	------	0.004	0.004
Cadmium (Cd)	0.0010	-----	-----

Howmet's viewpoint is that the pre-1980 cobalt would be disqualified for superalloy applications because the sulfur content is in excess of 0.001% and problems due to carbon and other unidentified trace elements.

From a cursory check of its records, Howmet noted that the cobalt it had purchased from the stockpile was used only to produce air melted superalloys because of the high content of undesirable elements. This supports the conclusion that the pre-1980 cobalt can not be used to produce vacuum grade alloys.

Composition limits for the Cannon-Muskegon specification for cobalt used in producing vacuum melted superalloys are given in Table 4-2. According to Cannon-Muskegon, it is not necessary for nickel to be as low as specified in recent government specifications because nickel is present in virtually all cobalt base superalloys.

The Cabot panelist emphasized that the wide range of types of melting equipment utilized in his company provides flexibility for refining less pure cobalt for the production of a variety of cobalt base and nickel base alloys. However, there are certain residuals such as nickel, copper, and tin that cannot be removed by any known pyrometallurgical procedure. These residuals can only be controlled by dilution. Residual trace elements can be reduced to acceptable levels but extended furnace refining times may be required and if a number of residuals must be removed from the same lot of cobalt several different furnace practices may be required.

The consensus of the panel was that the pre-1980 cobalt in its present state of characterization (limited to six elements) and documentation (incomplete analytical records and lot number traceability) is unsuitable for direct use in superalloys for aircraft engine applications, or any other application requiring vacuum melted material.

This assessment is supported by results of analyses of samples from two lots of pre-1953 stockpile cobalt conducted by several superalloy producers under the auspices of TSSIC (Tool and Stainless Steel Industry Committee). Ratings are summarized in Table 4-3.

C. Quality Requirements for High Strength Ferrous Alloys and Steels

Cobalt containing high strength steels include HY-180, HP-9-4-20, Marage 250 and AF1410. The nominal composition of these steels is as follows:

	C	Cr	Ni	Mo	Co	Al	Ti	V	Fe
				% by weight					
HY-180	.13	2.0	10.0	1.0	8.0	---	---	---	bal
HP-9-4-20	.18	0.8	9.0	1.0	4.5	---	---	.09	bal
Marage 250	.01	---	18.0	5.0	8.0	.10	.4	---	bal
AF 1410	.15	2.0	10.0	1.0	14.0	.005	---	---	bal

The general characteristics of these steels include high yield strength in the range 180 - 250 ksi, high fracture toughness, high impact strength, and minimum distortion during heat treatment. They are utilized in airframe structural components and in defense related applications, such as cannon recoil springs, antitank missiles, and light armor plate.

Producers report these steels are not as sensitive to the effects of undesirable trace elements (Bi, Sb, etc.) as are the vacuum melted nickel base superalloys. However, the properties of these high strength alloys are detrimentally affected by sulfur and carbon, both of which can not be reduced to acceptable levels during production of the vacuum melted steels.

Although some melters are able to lower the carbon level in vacuum induction melting, few have satisfactorily solved the problem of lowering sulfur in this melting process. Of the four steels listed in the above table, all except HP-9-4-20 are vacuum induction melted. On this basis the consensus of the producers was that cobalt should not contain more than 0.01% sulfur. For HP-9-4-20, sulfur could be as high as 0.02% because it can be lowered in the air melt process used for this steel. As previously noted, the other steels are vacuum melted and sulfur is not removed.

Grade 1 cobalt is more than adequate for producing vacuum melted high strength steels. Grade 2 cobalt would probably be usable for some of these grades. Grade 2 cobalt would be satisfactory for HP-9-4-20 because carbon and sulfur are removed by the air melt process. It is likely that Grade 3 (pre-1980 cobalt) would be suitable for this air melt alloy.

Table 4-3. Rating of Samples from Two Lots of Pre-1953 Cobalt in National Defense Stockpile. (Samples analyzed for 22 residual elements.)

Rating "0" - Absolutely not acceptable
Rating "10" - Quite acceptable

Types of materials	Lot A ratings	Lot B ratings
Superalloys		
Aircraft rotating parts	"0 → 5"	All "0"
Aircraft non-rotating parts	"2 → 7"	"0 → 5"
Electronic alloys	"9"	"5"
Magnetic alloys	"7"	"0"
High strength alloys	"0 → 9"	"0 → 9"
Casting blades	Not rated	Not rated
Air melt tool steels	"10"	"10"

For ratings "5→7", for example, both lots would require extensive blending with high quality cobalt to dilute levels of certain unacceptable elements. For "0" rating, impossible to blend sufficiently.

Source: Tool and Stainless Steel Industry Committee (TSSIC)

While it is not feasible to designate a grade of cobalt for each category of material application, producers of the high strength steels suggest the following composition limits:

	% max		% max		% max
Ni	0.5	Si	0.05	Bi	0.005
Fe	0.2	Al	0.02	As	0.005
Mn	0.1	S	0.01	Sb	0.005
Cu	0.02	C	0.01	P	0.01
Pb	0.01	O	0.01	Sn	0.002
Zn	0.01	N	0.01	Se	0.002

Cobalt containing high speed tool steels produced by air melting can be considered to require the same quality of cobalt as the air melted high strength steels. Grade 2 cobalt is adequate for this application.

D. Quality Requirements for Extra Fine Powder for Cemented Carbides.

Extra fine powder manufactured by the process employed by Carolmet, Inc. requires most stringent composition limits for cobalt, as shown in the specification in Table 4-4. Information provided to the panel by Carolmet stated that elements which are especially detrimental are nickel and the oxide formers: calcium, silicon and aluminum. Nickel promotes microporosity because it does not wet tungsten carbide particles as well as cobalt.

Calcium also causes microporosity and should be held to 0.02% or lower to preclude this problem. The presence of silica, alumina, and calcia results in inclusions which are detrimental. Both microporosity and inclusions lower the mechanical properties for cemented carbides and reduce the performance and life of cutting tools.

Table 4-4. Specification for Cobalt Feedstock Required by Carolmet Inc. for Producing Extra Fine Powder (a)

Element	% max
Cobalt (Co)	99.85 min
Nickel (Ni)	0.065
Iron (Fe)	0.020
Manganese (Mn)	0.010
Copper (Cu)	0.005
Lead (Pb)	0.005
Zinc (Zn)	0.010
Silicon (Si)	0.005
Aluminum (Al)	0.005
Sulfur (S)	0.010
Carbon (C)	0.050
Calcium (Ca)	0.020
Magnesium (Mg)	0.010
Sodium (Na)	0.020
Chlorine (Cl)	0.040

(a) Feedstock is broken cathodes ranging between three and fifty millimeters in size.

The panel recognized that the grade 1 specification for nickel (0.50%) and certain other elements (Fe, Si, Mn, Al) exceed the stringent composition limits in the Carolmet specification for cobalt. Because nickel and certain other elements, which are undesirable for the Carolmet process at the levels specified in the composition for grade 1, are not a problem in the production of nickel base and cobalt base superalloys -- the largest use for grade 1 cobalt -- the panel felt that it was unduly restrictive to hold to the Carolmet specification. Should an immediate emergency arise, cobalt for the Carolmet process could be supplied through lot selection from the 5,200,000 pounds added to the stockpile in 1981-82.

However, other significant considerations were recognized by the panel in developing the options for production of extra fine powder. The panelist from Hall Chemical Co. stated that the chemical industry, which produces cobalt catalysts and other cobalt products, has processing technology in place for preparing feedstock of the purity level required by the Carolmet process utilizing pre-1980 cobalt or any cobalt bearing stock including secondary materials. The panel urged that a pilot program be conducted to confirm this capability because it appears to offer a viable option to avoid the need to stockpile a special high purity grade of cobalt for producing extra fine powder.

Significant information on production of extra fine powder for cemented carbides was also presented by the technical advisor to the panel from GTE Products Corp. The GTE chemical process does not require high quality cobalt. The company has a proven manufacturing facility in operation and has been supplying extra fine powder to the cemented carbide industry for the past five years using secondary materials as feedstock. The panel concluded that this established technology could utilize any of the pre-1980 stockpile cobalt without proof from pilot tests.

The panel concurred that a decision on the need for a modified grade 1 specification to provide feedstock for the Carolmet process for extra fine powder be withheld until the evaluation of the chemical purification technology has been completed.

E. Quality Requirements for Magnetic and Electronic Alloys

Cobalt is used primarily in permanent magnets (hard) and in smaller quantities in magnetically soft materials which do not retain magnetism when removed from a magnetic field. Cobalt magnets are widely employed in electrical and communications equipment vital to industry and to defense. The compositions of selected permanent (hard) and soft magnetic materials are given in Table 4-5 and Table 4-6.

The opinion of the panelist from Bell Laboratories was that the amounts of carbon, sulfur, and nickel in the pre-1980 stockpile cobalt make it unsuitable for producing Remendur, Vicalloy, Supermendur, Alnico 5 (and higher) magnetic alloys, and the Kovar glass sealing alloy. (Bell Laboratory specifications for Remedurs, Vicalloy, and Kovar are given in Table 4-7).

Table 4-5. Nominal Compositions of Selected Permanent (Hard) Magnet Materials

Designation	Nominal composition
3½% Cr steel	Fe-3.5Cr-1C
6% W steel	Fe-6W-0.5Cr-0.7C
17% Co steel	Fe-17Co-8.25W-2.5Cr-0.7C
36% Co steel	Fe-36Co-3.75W-5.75Cr-0.8C
Cast Alnico 1	Fe-12Al-21Ni-5Co-3Cu
Cast Alnico 2	Fe-10Al-19Ni-13Co-3Cu
Cast Alnico 3	Fe-12Al-25Ni-3Cu
Cast Alnico 4	Fe-12Al-27Ni-5Co
Cast Alnico 5	Fe-8.5Al-14.5Ni-24Co-3Cu
Cast Alnico 5DG	Fe-8.5Al-14.5Ni-24Co-3Cu
Cast Alnico 5-7	Fe-8.5Al-14.5Ni-24Co-3Cu
Cast Alnico 6	Fe-8Al-16Ni-24Co-3Cu-2Ti
Cast Alnico 7	Fe-8Al-18Ni-24Co-4Cu-5Ti
Cast Alnico 8	Fe-7Al-15Ni-35Co-4Cu-5Ti
Cast Alnico 9	Fe-7Al-15Ni-35Co-4Cu-5Ti
Cast Alnico 12	Fe-6Al-18Ni-35Co-8Ti
Sintered Alnico 2	Fe-10Al-17Ni-12.5Co-6Cu
Sintered Alnico 4	Fe-12Al-28Ni-5Co
Sintered Alnico 5	Fe-8.5Al-14.5Ni-24Co-3Cu
Sintered Alnico 6	Fe-8Al-16Ni-24Co-3Cu-2Ti
Sintered Alnico 8	Fe-7Al-15Ni-35Co-4Cu-5Ti
Bonded ferrite A	$BaO-6Fe_2O_3$ + organics
Bonded ferrite B	$BaO-6Fe_2O_3$ + organics
Sintered ferrite 1	$BaO-6Fe_2O_3$
Sintered ferrite 2	$BaO-6Fe_2O_3$
Sintered ferrite 3	$BaO-6Fe_2O_3$
Sintered ferrite 4	$SrO-6Fe_2O_3$
Sintered ferrite 5	$SrO-6Fe_2O_3$
Lodex 30	9.9Fe-5.5Co-77.0Pb-8.6Sb
Lodex 31	16.0Fe-9.0Co-67.5Pb-7.5Sb
Lodex 32	19.2Fe-10.8Co-63.0Pb-7.0Sb
Lodex 33	21.9Fe-12.3Co-59.2Pb-6.6Sb
Lodex 36	9.9Fe-5.5Co-77Pb-8.6Sb
Lodex 37	16Fe-9Co-67.5Pb-7.5Sb
Lodex 38	19.2Fe-10.8Co-63Pb-7.0Sb
Lodex 40	9.9Fe-5.5Co-77Pb-8.6Sb
Lodex 41	16Fe-9Co-67.5Pb-7.5Sb
Lodex 42	19.2Fe-10.8Co-63.0Pb-7.0Sb
Lodex 43	21.9Fe-12.3Co-59.2Pb-6.6Sb
P-6 alloy	45Fe-45Co-6Ni-4V

(continued on next page)

Table 4-5 Cont.

Cunife	20Fe-20Ni-60Cu
Cunico	29Co-21Ni-50Cu
Vicalloy I	39Fe-51Co-10V
Vicalloy II	35Fe-52Co-13V
Remalloy I	17Mo-12Co-71Fe
Remalloy 2	20Mo-12Co-68Fe
Platinum cobalt	76.7Pt-23.3Co
Cobalt rare earth 1	Co_5Sm
Cobalt rare earth 2	Co_5Sm
Cobalt rare earth 3	Co_5Sm
Cobalt rare earth 4	$(Co, Cu, Fe)_7Sm$

Source: ASM Metals Handbook Ninth Edition; Vol. 3, 1980

The limits on carbon, sulfur, and nickel vary with the particular alloy, but some require carbon as low as 0.01% max, sulfur 0.005% max, and nickel 0.2% max. High cobalt magnetic alloys are particularly sensitive to the nickel content.

In addition to the elements cited above, specific cobalt containing magnetic or electronic alloys may require the following maximum limits: manganese 0.4%; copper 0.1%; silicon 0.01%; oxygen 0.03%; and phosphorus 0.003%.

In soft magnetic alloys, interstitial impurities such as carbon, nitrogen, oxygen, and sulfur raise the coercive force of the alloy resulting in electrical losses. These impurities can cause leaky seals in glass sealing alloys.

In hard magnetic alloys, impurities can alter the basic properties and behavior of the alloy. As in superalloys, grain boundary embrittlement can occur resulting in hot shortness; manganese is added to magnetic alloys subjected to hot working to prevent this condition.

The information provided by the panelist from Bell Laboratories concluded that most of the permanent magnet alloys could technically be produced with grade 2 cobalt, but the specifications now controlling a number of these alloys would require minor changes probably to permit higher nickel, manganese, and silicon. These permanent magnet alloys include: Alnico alloys 1-6 (5-24% Co); rare earth-cobalt alloys (50-65% Co); Vicalloy (52% Co); Cr-Co-Fe alloys (7-23% Co); Cunico (20% Co); and Remalloy (12% Co).

Bell Laboratories also noted that certain soft magnetic alloys could technically be produced from grade 2 cobalt including Hypercos (27-35% Co) and Permendurs (49-50% Co) and the glass sealing alloy Kovar (17% Co).

Magnetic alloys requiring grade 1 cobalt include the hard magnetic alloys Alnico 8 and above (35-40% Co); semihard Remendurs (49% Co); Nibcolloy (85% Co); and the soft magnetic alloy Supermendur (49% Co).

It was concluded that the technical requirements for cobalt in the variety of magnetic and electronic alloys that are produced appear to be more specific than in the other applications considered in the assessment and may involve some proprietary considerations. Also, advances in performance standards in communications equipment are promoting rapid changes in technology and usage in these applications. Additional information from users and producers should be developed to determine the quality of cobalt required for magnetic and electronic alloys. Information gathering methodology such as employed by an Industrial Evaluation Board would be useful for this purpose.

A communication to the panel from Indiana General Magnet Products Division noted some typical changes that are taking place, including the fact that Alnico usage has declined drastically in recent years both here and abroad. Many applications have switched to ceramic magnets. A new material (21-25% Cr, 8-15% Co, bal Fe) having Alnico 5 magnetic properties with ductility is being produced in small quantities. The fastest growing permanent magnet materials are the highly efficient rare earth-cobalt alloys (RE-Co) containing 50-68% cobalt. In the opinion of Indiana General, both the Cr-Co-Fe alloys and RE-Co alloys would require grade 1 cobalt.

Table 4-6. Typical Composition of Iron-Nickel and Iron-Cobalt Soft Magnetic Alloys

Material	Nominal composition(a)
45 Permalloy	45Ni
4750 alloy	47-50Ni
Carpenter 49 alloy	47-50Ni
Conpernik	50Ni
Orthonol	50Ni
78 Permalloy	78Ni
4-79 Moly Permalloy	79Ni, 4Mo
Hymu 80	79Ni, 4Mo
Supermalloy	79Ni, 5Mo
Mumetal	77Ni, 5Cu, 2.75Cr
Permendur	50Co
2V Permendur	49Co, 2V
Hiperco 2.7	37Co, 0.6 Cr
Supermendur	49Co, 2V
2-81 Moly Permalloy powder	81Ni, 2Mo
Carbonyl iron powder	----------

(a) Remainder iron plus deoxidizer.

Source: ASM Metals Handbook Ninth Edition; Vol. 3, 1980

Requirements for cobalt quality to produce the RE-cobalt magnetic alloys should receive further consideration. These alloys have coercive forces much higher than other permanent magnet materials as well as other valuable high performance properties. The unique combination of properties, including temperature stability, is leading to a variety of new designs in components and products.

F. Quality Requirements for Chemical and Ceramic Compounds and Catalysts

Cobalt is used in a variety of chemical and ceramic compounds and as a catalyst in the oil refining and petrochemical industries. The panel member from Hall Chemical Co. reported that the chemical industry has the technology and processing facilities in place to convert any of the pre-1980 stockpile cobalt and scrap materials containing cobalt into high purity cobalt solutions, such as sulfate, chloride, nitrate, and acetate. Appropriate cobalt compounds can be prepared from these solutions and converted into high purity cobalt powder.

GTE Products Corp. has an operating facility preparing high purity cobalt solutions from secondary materials as a means of producing fine powder for cemented carbides as is noted elsewhere in this report.

Information on cobalt chemicals provided by the panelist from Hall Chemical Co. is summarized below:

1. Oil refining - Cobalt is used with molybdenum to produce a hydrotreating catalyst for desulfurizing and refining of heavy sulfur and residual crude oils. Any material containing cobalt can be used provided established purification steps precede the catalyst preparation. This is a widely used catalyst; estimated annual cobalt consumption is one million pounds.

Table 4-7. Composition Limits Specified by Bell Laboratories for Magnetic Alloys and Glass Sealing Alloy (Kovar)

Element	Remendur 17	Remendur 38	Remendur 48	Vicalloy I	Kovar
			% max		
Cobalt	49(a)	49(a)	49(a)	52(a)	17(a)
Nickel	0.2	0.2	0.2	0.2	29(a)
Iron			balance		
Manganese	0.25-0.4	0.25-0.4	0.25-0.4	0.5(a)	0.5
Vanadium	2.7	3.8	4.8	---	---
Silicon	0.2	0.2	0.2	0.24	0.2
Carbon	0.015	0.015	0.015	0.026	0.04
Sulfur	0.010	0.010	0.010	0.016	0.01
Phosphorus	0.010	0.010	0.010	0.003	0.01
Copper	-----	-----	-----	-----	0.1
Other	-----	-----	-----	-----	0.05

(a) Nominal

2. Petrochemical oxidizing catalyst - A purified cobalt organic chemical is used as an oxidizing catalyst in the production of octo-alcohols. Any of the stockpile cobalt is suitable for this application. Estimated annual consumption of cobalt is 300,000 to 400,000 lb.

3. Catalysts for synthetic fibers - Pre-1980 stockpile cobalt can be used to produce the high purity cobalt catalyst required for this application. Average annual consumption is about 800,000 lb of cobalt.

4. Ceramic products - This industry consumes about two million pounds of cobalt annually in the form of oxides and sulfates. The required compounds can be produced from pre-1980 stockpile cobalt.

5. Paints and dryers - The stockpile cobalt is suitable for these applications. Consumption is estimated at about 500,000 lb of cobalt annually.

The panel concurred that the chemical industry has in place the processing facilities for purification which can utilize the pre-1980 cobalt for its products. This suggests that a portion of the stockpile cobalt should be designated for use as-is to meet chemical product requirements.

Chapter 5

Experimental Pilot Tests to Upgrade Quality of Pre-1980 Stockpile Cobalt

A. General Considerations.

The panel strongly recommends that the government give high priority to pilot tests to evaluate existing chemical and metallurgical technology that could be applied to upgrade the quality of pre-1980 stockpile cobalt. The approaches which emerged from the panel's deliberations are:

1. Chemical Technology - Confirm that existing chemical processing technology utilizing pre-1980 stockpile cobalt will produce feedstock satisfactory for Carolmet to use in manufacture of extra fine powder for cemented carbides, and establish that chemical processing technology is a viable method to produce powder compacts of the required quality for vacuum melted superalloys.

2. Metallurgical Technology - Determine the most efficient metallurgical processing system for preprocessing the pre-1980 stockpile cobalt to the quality level required for vacuum melted superalloys and other applications requiring grade 1 quality.

Panel members offered to conduct the experimental pilot tests, starting immediately and at no cost to the project assessing the quality of the cobalt inventory, if arrangements can be made to provide an appropriate sample of pre-1980 stockpile cobalt in exchange for the same quantity of high quality cobalt. The panel urges the government to expedite arrangements for release of test quantities of contract 331 cobalt for the pilot tests.

The panel recommends that the most favorable pilot tests be followed with production scale trials to establish procedures that would be fully documented to provide immediate information on upgrading if a national emergency should arise before adequate quantities of grade 1 quality cobalt are made available either through procurement or by refining the pre-1980 cobalt.

An outline of the pilot tests proposed by the panel is indicated below.

B. Applications of Chemical Processing Technology to Refine Pre-1980 Stockpile Cobalt.

Test No. 1 - Experimental pilot evaluation for extra fine powder

Objective: Utilizing existing chemical processing technology, prepare feedstock from pre-1980 cobalt suitable for production of extra fine powder for cemented carbides by the Carolmet process.

Phase 1: Government will release 100 lb of stockpile cobalt from contract 331 to Hall Chemical Co. in exchange for the same amount of specification grade cobalt. Hall Chemical Co. will use its established chemical processing practices to prepare a cobalt chloride solution to Carolmet's specification.

Phase 2: Carolmet Inc. will employ its standard practices to produce extra fine powder from the solution prepared by Hall Chemical Co. This powder will be shipped to Carboloy Systems Dept., General Electric Co.

Phase 3: Carboloy Systems Dept. will manufacture cemented carbide cutting tools from the pilot powder and conduct performance tests in metal cutting operations in comparison with tools made from regular extra fine powder produced by Carolmet.

Test No. 2 - Experimental pilot evaluation of powder compacts for superalloys

Objective: Utilize established chemical processing technology to prepare powder compacts from contract 331 stockpile cobalt of grade 1 quality suitable for vacuum melted superalloys.

Phase 1: Government will release 100 lb of stockpile cobalt to GTE Products Corp. in exchange for the same amount of specification grade cobalt. GTE will apply its established chemical processing methods on a pilot scale to purify the cobalt solution to the composition which will yield grade 1 quality. This will be followed by reduction of the cobalt content to powder and production of compacts suitable for use in vacuum induction melting. GTE Products Corp. will provide an analysis of the cobalt powder, and transfer the pilot powder compacts to Howmet Turbine Components Corp.

Phase 2: Howmet Turbine Products Corp. will utilize the powder compacts in the vacuum induction melting process to produce a jet engine superalloy. Howmet Turbine Components Corp. will provide information on the suitability of the GTE pilot powder compacts for the production of vacuum melted superalloys for jet engine rotating parts. Attention will be directed to potential problems arising from pickup of oxygen and nitrogen by the powder compacts.

Test No. 3 - Advanced Pilot Evaluation for Extra Fine Powder

The panel suggested that if results of experimental pilot test No. 1 on chemical preparation of feedstock for extra fine powder by Carolmet process are favorable, arrangements should be made by the government for a production scale test using 5,000 lb of contract 331 stockpile cobalt. This would provide additional confirmation that pre-1980 stockpile cobalt can be utilized for production of extra fine powder by the Carolmet process.

Test No. 4 - Advanced pilot evaluation of chemical processing to produce grade 1 powder for superalloys

The panel concurred with the technical advisor from GTE Products Corp. that if the results of experimental pilot test No. 2 are favorable for production of grade 1 cobalt powder compacts for superalloys, arrangements should be made by the government for a production run using 5,000 to 10,000 lb of contract 331 stockpile cobalt. This full scale evaluation would provide valuable confirmation that existing chemical processing methods can be utilized to convert pre-1980 stockpile cobalt to grade 1 quality required for superalloy applications.

C. Applications of Metallurgical Processing Technology to Refine Pre-1980 Stockpile Cobalt.

Test No. 1 - Experimental pilot evaluation of argon-oxygen decarburization (AOD) process to upgrade quality of stockpile cobalt

Objective: Utilize existing AOD processing technology to refine pre-1980 stockpile cobalt to grade 1 quality.

Phase 1: Government would provide 4,000 lb of contract 331 stockpile cobalt to Howmet Turbine Components Corp. for melt down in electric furnace followed by transfer to the AOD refining vessel. This appears to be the smallest experimental charge that can be handled by an AOD vessel in this country based on inquiries made by panel members. Samples for chemical analyses would be taken following melt down of the 4,000 lb charge and at appropriate stages during the AOD refining process. A sample taken when the cobalt is tapped from the AOD would be analyzed for all elements identified in the specification for grade 1 quality.

Phase 2: If analysis of the AOD refined cobalt shows that some elements are higher than permitted by the grade 1 specification, portions of the AOD cobalt would be used to produce superalloys utilizing vacuum induction melting (VIM) plus vacuum arc refining (VAR) with analysis made at each step to secure information on removal of undesirable elements.

Test No. 2 - Experimental pilot evaluation of metallurgical processing systems, other than AOD, for purification of stockpile cobalt

Objective: Conduct small scale experiments utilizing electroslag refining (ESR); electron beam (EB) refining; vacuum induction melting (VIM); and vacuum arc refining (VAR) to provide information on the processing system that is most efficient for purification of pre-1980 stockpile cobalt.

Phase 1: Government will arrange to release 100 lb of contract 331 stockpile cobalt to Ames Metals Development Laboratory in exchange for specification grade cobalt to conduct metallurgical processing experiments utilizing 10 lb samples as follows:

ESR - Three experimental melts with 10 lb charges. The effect of slag composition on purification will be determined. The commercial calcium flouride (CaF) slag will be utilized with selected additions fo the three experiments.

EB - Two electron beam melting experiments each using 10 lb of cobalt. Retention time and pressure over melt will be varied to determine effect on purification.

VIM - Two melts of 10 lb each to study variations in vapor pressure and retention on removal of undesirable elements. Excessive evolution of gas will be investigated.

VAR - Two melts of 10 lb each to study effects of pressure and other variables on purification.

NOTE: The results of initial tests may suggest that some of the experiments be conducted utilizing a combination of melting systems.

Precise chemical analysis for all elements in the specification for grade 1 cobalt will be conducted at appropriate steps in the processing experiments.

Phase 2: Analytical data from the melting experiments will be evaluated to determine the relative effectiveness of the various metal processing tests for eliminating undesirable elements. These conclusions will serve as a basis for recommendations on trials in larger scale industrial facilities.

The Ames Laboratory has offered to conduct the experimental pilot studies at no cost to the project assessing the quality of the cobalt inventory.

Test No. 3 - Advanced pilot evaluation of AOD process for refining pre-1980 stockpile cobalt

The panel suggested that the AOD experimental pilot test be followed with a 25,000-50,000 lb full scale industrial melt. The procedure used should be fully documented to establish recommended commercial practice to be followed by industry in event of a crisis for preprocessing pre-1980 stockpile cobalt to grade 1 quality for superalloys and other applications.

Pyrometallurgical pilot studies should include an assessment of the form and size of the refined cobalt that will be most useful to users of cobalt. Although the current stockpile inventory contains primarily rondelles, granules, and broken cathodes, other forms, such as cast pigs weighing 5 to 10 lb, may provide easier handling and be freer of contaminants.

Test No. 4 - Advanced pilot evaluation of the most efficient purification system indicated by the Ames experiments

The panel suggested that the metallurgical system showing the most efficiency for removal of undesirable elements in the Ames experiments be carried out in a 5,000 to 10,000 lb industrial facility. Information on the preferred procedure for purification should be fully documented to be available for use by industry in event of a crisis to refine stockpile cobalt to Grade 1 quality.

Senator HUMPHREY. I had the impression that it was finished.

Mr. MAGUIRE. We are reviewing it at this point in time.

Senator HUMPHREY. There is a great deal of concern, as you must know, about the quality and condition of materials in the stockpile.

Is that what this study addresses?

Mr. MAGUIRE. This is one of a series of studies that we are conducting to review the quality of materials in the stockpile.

Senator HUMPHREY. When are you going to let us in on the information?

Mr. MAGUIRE. Promptly, sir.

Senator HUMPHREY. Do we have to request it by legislation or can we have some cooperation?

When will the cobalt study be done?

Mr. MAGUIRE. The cobalt study has been completed. Our review will be completed within 60 days. We will provide the subcommittee with a report.

Senator HUMPHREY. Thank you.

May we have copies of the other reports when they are available, please?

Mr. MAGUIRE. Certainly.

UPGRADING STOCKPILE MATERIALS

Senator HUMPHREY. Will you explain the stand on this program you spoke of on page 5 of exchange of excess stockpile materials in an upgrading program? What is that all about?

Mr. MAGUIRE. The raw materials that are in the stockpile are not necessarily those materials which will be needed for input to some production process. The further along in the process that we can bring those materials, the more valuable the stockpile is to us.

This program of upgrading is one that brings the stockpile materials further along that chain.

Senator HUMPHREY. Some kind of processing, is that it? Change in the form or the quality or what?

Mr. MAGUIRE. Change in the form from an initial ore to a more refined form further down the line toward final product.

Senator HUMPHREY. How does this ferromanganese program work? You are converting ore to what? How are you producing increased quantities?

Mr. MAGUIRE. Let me ask Paul Krueger to join me here at the table to provide that answer.

Senator HUMPHREY. Sure.

Mr. KRUEGER. This is a 10-year program authorized by the President pursuant to recommendation by the Department of Commerce under section 232 of the Trade Expansion Act.

Senator HUMPHREY. I don't want all that stuff. Just tell me how you change dross into gold?

Mr. KRUEGER. Basically, you take the ore which is largely chrome oxide and manganese oxide, and smelt it into an alloy of iron, silicon, and chrome, or manganese.

The actual procedure and processing is being done by Mr. Jones' organization; in particular, the management, or mechanics of the Government acquisition of this is set by Mr. Jones.

SIZE OF UPGRADING PROGRAM

Senator HUMPHREY. I addressed it to Mr. Maguire because it was in his testimony. This is a small program, I guess, Mr. Jones. Is that correct?

Mr. JONES. No. It is not a small program. We are talking effectively of 1 million tons spread over a 10-year period, 500,000 tons of ferrochrome, 500,000 tons of ferromanganese.

The actual cost is probably in the neighborhood of $50 million per year. How it is to be paid for in the way it is set up? The successful bidder will be given credits upon which he can bid against materials we are selling from the stockpile.

So, that that $50 million or whatever the final number comes out to be, but it appears it is going to be somewhere in the neighborhood of $50 million, is $50 million that will not go into the transaction fund to be used for acquisition.

Senator HUMPHREY. I am sorry, will you repeat that last?

Mr. JONES. The $50 million figure or thereabouts annually is $50 million that will not be going into the transaction fund to fund further acquisitions or priority materials.

Senator HUMPHREY. It will be reserved instead for this program, is that it?

Mr. JONES. Yes, sir, they will be bidding down because, as I indicated before, the sensitivity of the marketplace to absorb the flow of commodities, and whether they are acquired by one of our successful bidders, they are going to be in the marketplace immediately because they are going to discount them or whatever, so that that $50 million, or whatever number it amounts to, is being drawn down against the commodities that I have for sale is $50 million that will not be going into the transaction fund.

Senator HUMPHREY. Senator Levin?

Senator LEVIN. Thank you, Mr. Chairman.

STUDY ON SILVER SALES

One of the issues which intrigues me is the report on silver which the chairman has already inquired about.

Is it your understanding, Mr. Maguire, that this study was supposed to have been filed with the Congress on July 1, 1982?

Mr. MAGUIRE. That is my understanding; that is correct, July 1, 1982.

Senator HUMPHREY. Mr. Jones?

Mr. JONES. That is correct.

Senator Humphrey. You said that this is tied up in some interagency council or other?

Mr. JONES. Yes, sir.

Senator LEVIN. Who submitted it to the interagency task force? Was that FEMA or GSA?

Mr. JONES. No. It did not come to us, Senator Levin. It was directed to the President who assigned it to one of the Cabinet Councils on Natural Resources Environment.

Senator LEVIN. Have you seen this study?

Mr. JONES. No, sir.

Mr. MAGUIRE. I have not.

Senator LEVIN. Who drafted this study?

Mr. MAGUIRE. If the study is complete, it is someplace in the Department of the Interior.

Mr. KRUEGER. An interagency effort drafted it. There was input from FEMA to the study. FEMA submitted its required input in April 1982.

Senator LEVIN. The study does exist somewhere?

Mr. KRUEGER. It is with the Department of the Interior.

Senator LEVIN. There is a study which exists?

Mr. KRUEGER. Yes.

Senator LEVIN. The question now is whether that study is going to be sent over to the Congress?

Mr. KRUEGER. That is correct.

Senator LEVIN. Who is the head of that interagency task force?

Mr. KRUEGER. It is headed by Assistant Secretary designee W. Perry Pendley, who was designated by Secretary Watt.

Senator LEVIN. Mr. Chairman, this has been going on now for so long. This is all deja vu with you as it is with me.

I wonder if the chairman might consider getting them over here to tell us why they don't obey the law. This administration presumably is a law-abiding administration, at least in most respects they are.

We ought to insist that they do what the law quite clearly indicates, that no later than July 1, 1982, make a determination.

Senator HUMPHREY. I agree with the Senator. We will do all that we can.

$500 MILLION CEILING

Senator LEVIN. The 5-year plan which you have given to us assumes two things.

Number 1, that you are allowed to sell silver.

Number 2, that the $500 million ceiling on the balance in the stockpile transaction fund is eliminated.

Is that true?

Mr. MAGUIRE. That is correct, Senator.

Senator LEVIN. Does that mean that the administration has made the decision, both to sell silver and to try to get an elimination of the $500 million ceiling?

Mr. MAGUIRE. I don't believe we have the authority to make those decisions.

Senator LEVIN. Has the administration decided? I am not saying have you decided. Has the administration decided to seek elimination of the $500 million limit?

Mr. MAGUIRE. I don't believe the administration has decided either that we will get rid of the congressional hold on silver or that the $500 million limit will be lifted.

That is a goal that we have in stockpile management, and it is up to the Congress to make the decisions on both of those issues.

Senator LEVIN. Your 5-year plan makes two assumptions?

Mr. MAGUIRE. That is correct.

Senator LEVIN. One about silver, another one about the $500 million ceiling being lifted.

You are telling us that you have made two assumptions, you don't have any position on it?

Mr. MAGUIRE. Our position is that if we are to achieve the stockpile goals, congressional action is needed to remove the constraints that we have. Two of those constraints are:

One, our inability to sell excess stockpile materials.

Second, the inability to go beyond the $500 million limitation.

Both of those, as Mr. Jones has already testified, will result in very long-term programs of filling stockpile goals.

Senator LEVIN. Do you support elimination of the $500 million ceiling? Does your agency support it?

Mr. MAGUIRE. FEMA at this point does not support lifting that ceiling.

FIVE-YEAR MATERIALS PLAN

Senator LEVIN. Did you participate in this 5-year plan?

Mr. MAGUIRE. I did not.

Senator LEVIN. Did your agency?

Mr. MAGUIRE. The agency did.

Senator LEVIN. The agency has given us a 5-year plan based on an assumption you don't agree with? Is that a fair statement?

Mr. MAGUIRE. FEMA is telling you what needs to be done to fill the stockpile goals and outlining reasonable assumptions to put into that plan.

Senator LEVIN. Let me restate my question.

The agency participated in the creation of a 5-year plan which you have submitted to us and one of the assumptions that is necessary to be met for that 5-year plan to be accomplished is an assumption you don't agree with?

Mr. MAGUIRE. That is correct.

Senator LEVIN. I appreciate your candor. I am sorry to put you on the spot, except I don't know any other way to do it, to find out where we are going——

Mr. MAGUIRE. Senator, I share your concern.

Senator LEVIN [continuing]. With our stockpile.

I am just wondering whether we can't get somebody in here who can speak for the administration. We are given a plan which is based on assumptions which I don't think the stockpile managers agree with.

If the administration agrees with them, if they like those assumptions, let them come in here to defend them and recommend legislation to change the ceiling, to sell silver and do something. I don't think you can have it both ways.

I am not yelling at you guys. You are stockpile managers. I doubt that you want to lift the $500 million ceiling. You would love to sell silver. You can't get the administration to agree. I don't think we have the right folks in here. I really don't.

I think we have to get in here the people, OMB, and whoever that interagency task force is that makes the decision. If they want to lift the $500 million limit, let them come in and say they want to lift it.

This is based on an assumption which is a completely hollow document as far as I am concerned. Unless there is a decision made to lift the $500 million limit, which I am not inclined to do, or to sell

silver, we can't get either a recommendation to lift the limit or to sell silver.

In one case there is a deadline which was passed over a year ago on the silver study. I would love to ask more questions. I have a lot of them, but I think we are really kind of pushing the wrong folks.

I would much rather be pushing OMB and the White House or Interior or whoever it is now who are making these assumptions and saying those are the administration's assumptions.

Otherwise, this 5-year report, you might as well take a piece of paper and write anything on it and float it down Pennsylvania Avenue and say this is a 5-year report. It is a meaningless, hollow, irrelevant report as far as I am concerned until someone comes in here and says we believe in that, we want you to lift the $500 million limit. We want you to sell silver.

SILVER SALES ASSUMPTION

The report says we sell silver in 1984, but the administration does not give us a report showing that they want to sell silver. If there is a ducking of the issue, it is this report.

I am not inclined to ask any more questions because I would be participating in ducking the issue, too, because the issue has to be joined between the decisionmakers on this issue, which is not this gentleman, but OMB, the interagency task force and White House rather than stockpile managers.

I hope we can get the right people in for a hearing. Until we do, I think we are leaving this issue at the wrong step. When I have to decide do I want to lift that limit or not; do I want to sell silver or not; I would like to have guidance from administration on it.

So far as I am concerned, Congress is ducking the issue. As I understand it, the defense function assumes the sale of silver in 1984?

Mr. MAGUIRE. We are assuming that.

Senator HUMPHREY. The defense function assumes the sale of silver?

Mr. MAGUIRE. The Defense Department also.

Senator HUMPHREY. It is a hollow budget unless silver is going to be sold. You would think if the defense function assumes the sale of silver, you would think that the administration would have reached the conclusion that it wants to sell silver, but you can't even tell us that today; is that right?

Mr. MAGUIRE. That is correct.

Senator LEVIN. Clearly, they want it both ways. They want to take the proceeds of the sale of silver for budget purposes, but duck the issue of whether they sell silver in terms of stockpile and all the other process involved in selling silver.

I don't know whether you want to sell silver or not. I am not advocating selling silver or not selling it. I am trying to look beyond, toward honesty in budgeting.

If we don't want to sell silver, let us not sell the silver. I am talking to the Congress as much as you folks. I don't want to berate you. I think, basically, your heart is in the right place.

I think we should get the right people. I hope the Chair will try to do that.

Senator HUMPHREY. We will do that. It is very frustrating because year after year it is the same old nonsense, playing around with the strategic stockpile despite all of the lofty statements about the need for defense preparedness.

It does get very disgusting and discouraging. I hope our witnesses will understand why we seem a little disgusted sometimes.

It is not fair to you, but you are the nearest convenient witnesses and that explains it.

Let me follow up with a few questions which are legitimately directed to you.

QUALITY OF STOCKPILE MATERIALS

In advance of these formal reports, Mr. Jones, just as a general statement, what is the quality of the material in the stockpile?

Are you concerned about any particular commodities and what are we doing?

Mr. JONES. We on a continuing basis do our own quality assurance examinations of various commodities in the stockpile. We are satisfied that considering what we got in, and some of the materials here date back to the early 1950's, that perhaps at the time we received them, a certain quality was required.

If that quality is increased, obviously the chance does not occur to upgrade, such as the cobalt that we had acquired many years ago probably is not of the same caliber of the cobalt we recently acquired from Zaire.

It is my opinion that the commodities are well cared for, they are secure. From time to time we have a loss that may not be avoidable, small pilferage, that sort of thing.

I think on balance the commodities are well cared for and many of them are not subject to deterioration.

Mr. MAGUIRE. I would like to amplify on that, Mr. Chairman, if I could.

I had the opportunity with Mr. Jones to visit some of the stockpile sites. Some of them are exactly what he has portrayed, well cared for and very secure storage places.

I think ongoing studies are looking at new technologies available today, better specifications for material which are able to provide much finer materials than were provided to the stockpile when originally purchased.

Senator HUMPHREY. Fine.

Mr. JONES, then apart from changes in specifics, apart from whatever deficiencies might be there because of the change in specifics, the physical condition of these materials you represent to be good, adequate, no deterioriation worth mentioning?

Mr. JONES. Yes.

Senator HUMPHREY. That is good.

BARTER FOR STOCKPILE MATERIALS

As you will recall, we had a hearing scheduled in September on the subject of barter which means obtaining other materials. That hearing has been rescheduled for November.

What is the status of the intergovernmental group review?

Mr. JONES. Coincidentally, there was a hearing this morning over in the House on Chairman Bennett's barter bill. There was a panel, I believe, of six of us at the table, each representing separate agencies, State, Defense, U.S. Trade Representative, Agriculture, GSA.

As each individual testified it was pointed out to Chairman Bennett that the administration does not yet have a firm position on the subject of barter. He was advised of the interdepartmental group which is studying it.

Coincidentally, there is a meeting scheduled at 3 p.m. this afternoon at the Treasury Department which is the lead agency in running this group.

It would be my belief that within the next 3 to 4 weeks the interdepartmental group should have arrived at a position where they can brief the senior intergovernmental group which is chaired by Secretary Regan and this is the senior interdepartmental group on international economic policy, at which time the SIG, as it is called, will arrive at a decision as to what the position of the administration is on this topic.

Basically, it boils down to one of three ways:

The ad hoc bartering we have been doing such as the Jamaican bauxite, no bartering whatsoever, or full bartering.

After listening to the testimony this morning, it occurred to me that whichever way we go, if we do go with barter and we are bartering agricultural commodities, we are back in the budget routine again where we barter away $50 million worth of agricultural commodities, CCC is under obligation to buy $50 million more.

Where do they get the $50 million? Either the transaction fund under the present law or new law which says no reimbursement.

They will have simply to go back and seek further appropriation.

Senator HUMPHREY. Which is the lead agency in this SIG study?

Mr. JONES. The Department of Treasury.

Senator HUMPHREY. What level of confidence do you have that you will be ready for this hearing then in late November?

Mr. JONES. I am firmly convinced at this point in time, Senator, that indeed the SIG will have met and will have resolved and established a position of the administration on the issue of barter.

Senator HUMPHREY. That will be the last obstacle standing in the way to having a hearing on this issue?

Mr. JONES. Yes, sir.

Senator HUMPHREY. It is my intention to have that hearing. Even if the Congress is in recess by that time, I will return to Washington. I think it is of the utmost inportance we get moving on this, that we remove the road blocks and use our agricultural surplus through barter as a means of filling the strategic stockpile.

Mr. Maguire, let me ask you a question you can answer for the record in detail if you prefer.

STABILITY OF GOALS

The administration last year announced our defense planning would include plans for a global conflict, which is a change in the scope of things on which to base plans.

Obviously, our resource requirements are substantially raised by such criteria.

Have there been any changes made in the stockpile goals to meet this larger scale conflict?

Mr. MAGUIRE. I prefer to provide an answer for the record.

Senator HUMPHREY. If you will in detail, please. I think that is a very important consideration.

[The information follows:]

The goals for stockpile materials have not changed. Results of an ongoing interagency study of the assumptions used to determine stockpile requirements may change stockpile goals within the next 12 months. The study was undertaken as a part of the Emergency Management Preparedness Board review of the stockpile and associated issues, pursuant to the President's National Plan of Action on Emergency Mobilizaton Preparedness. The Congress will be kept advised about the results of this interagency study.

Senator HUMPHREY. Thank you for coming. I am sorry if we have treated you a little rudely, but we have a responsibility just as you have. I, for one, am sick and tired of having this responsibility hanging over my head when so little is being done to discharge that responsibility.

I am not being critical of you folks. I think you are doing the best you can under the circumstances. It is really a cynical playing of politics with this issue of the strategic stockpile. I don't like being on watch while this kind of nonsense is going on.

[Questions with answers supplied follow:]

QUESTIONS SUBMITTED BY SENATOR GORDON J. HUMPHREY, ANSWERS SUPPLIED BY HON. CARROLL JONES, COMMISSIONER, FEDERAL PROPERTY RESOURCES SERVICES

Senator HUMPHREY. What was requested for stockpile purchases before the request was reviewed by GSA and OMB?

Mr. JONES. For fiscal year 1984, $300 million and for fiscal year 1985, $275 million.

Senator HUMPHREY. Why is $120 million the consistent request?

Mr. JONES. This level of approved acquisitions activity reflects current policy guidance.

Senator HUMPHREY. At this pace, how long will it take to fill the stockpile?

Mr. JONES. About 100 years.

Senator HUMPHREY. Are any materials in the stockpile of a quality that is too low for present defense industry needs?

Mr. JONES. In time of an emergency, all of the materials in the stockpile are usable for some purpose either in their present state or by upgrading. However, to be in a readiness posture higher quality levels or different forms of some commodities should be acquired for the stockpile. These may be acquired either through acquisition of materials or upgrading of present materials.

Senator HUMPHREY. What are they and what is being done to rotate them out of the stockpile?

Mr. JONES. The major commodities which need higher quality levels are those for the high-temperature alloy users and other high technology users. These are basically the metals such as chromium, cobalt, manganese and nickel, but also apply to other commodities for example, asbestos and mica.

Rotation, as defined in the Stock Piling Act, applies only to materials which are subject to deterioration, such as medicinals and rubber. Some rotation of rubber has been done and more is planned. For other commodities not subject to deterioration, we need another category in The Stock Piling Act covering rotation or upgrading for "technological obsolescence". This would allow updating the stockpile commodities for more stringent quality levels needed for advances in technology.

Senator HUMPHREY. Is the current split management between GSA and FEMA the most efficient way to run the stockpile?

Mr. JONES. Yes. The core of the stockpile management apparatus—the shared responsibilities of the Federal Emergency Management Agency (FEMA) and GSA—functions well.

Senator HUMPHREY. What would be the most efficient way of managing the stockpile?

Mr. JONES. We believe that the stockpile is being managed efficiently under the present arrangement.

Senator HUMPHREY. From the statements provided here today:

Requirements come from the various Federal agencies to FEMA for consolidation. The contracting, storage, and maintenance of the materials at GSA. Stockpiles are not being filled up at an acceptable rate to meet national requirements. Please comment.

Mr. JONES. We, at GSA, plan to make further progress in rebuilding the stockpile with resources available to us.

Senator HUMPHREY. Comments and/or statements indicate agreement that the present management arrangement is adequate. Do you feel that this is adequate?

Mr. JONES. Yes. We believe that there are no major problems in the current management apparatus for the National Defense Stockpile.

Senator HUMPHREY. Statements here today indicate that the management structure is not the major problem in meeting our national strategic stockpile goals of materials. Please comment.

Mr. JONES. Reduction of stockpile goal deficits is taking place consistent with resources available.

Senator HUMPHREY. Recommendations of possible problem areas: Congressional/legislative restrictions on the operation of the stockpile and/or the transaction fund; Marketplace pressures; Recommended and/or authorized funded levels; and Budget process/restrictions on the stockpile. Please comment.

Mr. JONES. We believe that there are no serious problem areas in the management of the stockpile.

Senator HUMPHREY. This subcommittee recently delayed our hearings on the use of barter to obtain additional materials for the stockpile while the Inter-Governmental Group (IG) of the administration studied the problem. Hearings were scheduled for September 17 and have been postponed until late November 1983.

What is the current status of the IG review? What is the schedule to complete the group work? Has a lead agency been established for the group? Do you have any comments on the expected results of the group or any conclusions reached thus far?

Mr. JONES. The review, led by the Department of Treasury, should be completed in the near future. We continue to maintain that barters be coordinated in an appropriate interagency forum to assure that suitable and needed materials are brought into the stockpile. Such a forum now exists via the Annual Materials Plan Steering Committee, chaired by FEMA, with participation by several agencies, including Agriculture and GSA.

Senator HUMPHREY. What is the status of the required report concerning sales of silver from the stockpile?

Mr. MAGUIRE. The required report is under review in the Cabinet Council on Natural Resources and the Environment. One of the difficulties lies in determining market impacts of selling stockpile silver in the face of an already soft market. The price of silver over the last 12 months has oscillated as much as 25 percent in a matter of days. Since May 1983 the present price is down 36 percent and falling. A major factor in the tentativeness in the market is the lack of a strong resumption in silver consumption.

Senator HUMPHREY. Are silver sales still included in the budget projections and, if so, why?

Mr. MAGUIRE. Yes. The financial planning assumptions for the stockpile are that the required report on silver sales will be issued supporting the release of excess silver from the stockpile and that Congress will then authorize the disposal of excess silver.

Senator HUMPHREY. The Government of Zaire made a proposal for a long-term purchase proposal for cobalt.

What is the status of the offer today?

Mr. MAGUIRE. Long-term purchase arrangements are not comtemplated for stockpile commodities since it is anticipated that competitive procurement procedures will be used. In fiscal year 1983, 4 million pounds of cobalt were purchased under competitive bidding procedures from Zaire. This leaves a shortfall of over 33 million pounds to be purchased in the future in order to reach the stockpile goal.

Senator HUMPHREY. Is the current split management between GSA and FEMA the most efficient way to run the stockpile?

Mr. MAGUIRE. The current organizational arrangement between FEMA and GSA are adequate and appropriate. These arrangements allow each agency to contribute those capabilities that each is best suited to provide.

Senator HUMPHREY. What would be the most efficient way of managing the stockpile?

Mr. MAGUIRE. The present system of management appears to be the most efficient.

Senator HUMPHREY. How do Soviet actions and the actions of their clients affect our material supplies that come from Southern Africa?

Mr. MAGUIRE. There have been no known effects to date.

[Whereupon, at 3:55 p.m., the subcommittee adjourned, subject to the call of the Chair.]

NATIONAL DEFENSE STOCKPILE

FRIDAY, NOVEMBER 18, 1983

U.S. SENATE,
SUBCOMMITTEE ON PREPAREDNESS,
COMMITTEE ON ARMED SERVICES,
Washington, D.C.

BARTER TO ENHANCE READINESS

The subcommittee met in open session pursuant to notice, at 10:34 a.m., in room SR-222, Russell Senate Office Building, Senator Gordon J. Humphrey (chairman) presiding.

Present: Senators Humphrey and Levin.

Staff present: George K. Johnson, Jr., and David S. Lyles, professional staff members; and Karen A. Love, staff assistant.

Also present: Ronald P. Kelly, assistant to Senator Humphrey; and Jon Etherton, assistant to Senator Jepsen.

OPENING STATEMENT BY SENATOR GORDON J. HUMPHREY, CHAIRMAN

Senator HUMPHREY. May I invite our first witness, Dr. Leo Mayer of the Department of Agriculture, to come to the witness table.

Mr. REYNOLDS. Sir, I'm sorry, but he will be a couple of minutes late.

Senator HUMPHREY. Then is Mr. Cornell from the Department of Treasury here?

Mr. CORNELL. Yes, sir.

Senator HUMPHREY. Very well.

The subcommittee meets this morning to receive testimony on the national strategic stockpile and the use of barter as a means of acquiring needed materials.

Mr. Cornell, do you have a statement?

Mr. CORNELL. Yes, sir, I do have a statement.

With your permission, I would like to summarize it as best as I can.

Senator HUMPHREY. Do you have something also for the record?

Mr. CORNELL. Yes, sir, I do.

Senator HUMPHREY. Very well.

Please proceed.

STATEMENT OF R. A. CORNELL, DEPUTY ASSISTANT SECRETARY, DEPARTMENT OF THE TREASURY

Mr. CORNELL. Sir, I appreciate the opportunity to present Treasury's views on barter and the sale of silver from the stockpile. Our

interest in Treasury focuses primarily on the current review of Government barter policy going on within the administration. I will describe briefly the role of the senior interdepartmental group on international economic policy, what we call in our jargon the SIG–IEP, in the administration's examination of policy regarding the barter of CCC and for that matter other Government-owned property or strategic material. The SIG has had the issue under review and the matter now is at the White House for decision. But administration policy has not yet been finally determined. We expect such a determination soon. As regards silver, we have considered at Treasury proposals for using stockpiled silver in commemorative and bullion coins. I will comment briefly on that review to date.

POLICY IMPLICATIONS

The discussion of stockpile barter in the SIG–IEP complements the recent policy reviews of the broader issue of countertrade that was carried out within the framework of the Trade Policy Committee headed by the USTR.

It is clear from this USTR-led review of countertrade, that the administration is unlikely to encourage a revival, at least in the same form, of the extensive barter programs that the Government undertook during the 1950's and 1960's. They created several problems. They required substantial administrative effort, and they very frequently resulted in displacements of commercial sales and created a limited U.S. flexibility in obtaining the least-cost supplies for the stockpile.

Nevertheless, and I want to stress this, several existing laws do authorize barter when it is in the best interest of the United States. The administration certainly recognizes that there is ample legislation now on the books which would justify and direct barter in certain circumstances.

In fact, this administration negotiated a barter arrangement with Jamaica last year, which we believe was mutually beneficial to both countries. Since other proposals are likely, we are moving to develop more specific policy guidance on handling them.

The barter issue has been discussed very thoroughly within the SIG, but we have not yet arrived, as I have said, at an administration position. As a result of this review, Secretary Regan, who is the chairman of the group, has forwarded a summary of agency positions to the NSC and requested a Presidential decision on barter policy. All agencies agree that interagency consideration of barter proposals is necessary; but the precise procedures and criteria for reviewing them are still not fully decided.

Let me say just a few words about the SIG–IEP and what it does.

The SIG was established by the National Security Council about a year and a half ago to provide an interagency framework for discussing the international economic implications of various issues which also have significant foreign policy or national security implications.

The Secretary of the Treasury chairs the group; the Secretary of State is the vice chairman. Other members include the Vice President, the Secretaries of Defense and Commerce, the head of OMB,

CIA, USTR, and the National Security Council. Other agencies participate when issues in their areas of responsibility or interest are discussed.

The SIG meets regularly, usually about once a week, and has effectively addressed a very heavy agenda of policy issues over the time of its existence.

In Treasury's view, the SIG is well suited to the task of examining barter proposals because barter proposals characteristically have implications for a number of different policy areas.

Examples are national defense stockpiles, agricultural policy, international trade policy, developing country trade balances and financial policy in general, foreign policy, and, finally, budget policy.

As a matter of fact, in the SIG's review of our current barter policies, there were approximately 15 agencies involved, and debate was very, very active. Almost all of those 15 agencies took fairly strong positions or at least expressed and had fairly strong views. The key thing to note here is that those views were based on policy interests which touched very close to the heart some of the things that those agencies are interested in.

The Treasury Department certainly appreciates the intense interest of several groups in the barter issue. On their face, barter proposals seem very straightforward: namely, send excess agricultural commodities or any other excess Government property to developing countries in exchange for materials which we need for our stockpile.

Very often, countries producing raw materials need additional imported food and have excess supplies of strategic commodities that they could send us. But to complete these exchanges, the United States probably would have to value the agricultural commodities below acquisition value and below U.S. market prices. This would amount to an export subsidy and could be a violation of the General Agreement on Tariffs and Trade rules.

The procedure for acquiring materials for the stockpile requires careful attention to priorities so that the most critical materials are acquired first. This is where barter affects stockpile policy directly. Since proposed barter arrangements very often involve commodities which are not compatible with the established priority schedule, we could misallocate stockpile resources unless these priorities are maintained. That is not easy when foreign policy and domestic interest group pressure come into play, as they always do when a barter proposal is on the table.

In negotiating barter arrangement, effective budget management could be jeopardized. I think the argument here is familiar. If the statutory requirement to reimburse CCC is removed, essentially the financing of the stockpile program is removed from the traditional budgetary process. This can lead to problems and lack of control, especially on the congressional side.

We would be concerned about new legislation being proposed to remove the CCC reimbursement provision.

Finally, in considering barter policy proposals, foreign policy impacts need very careful attention. Barters with concessionary terms do provoke requests from other nations for similar arrangements, and they provoke protests from competing exporting countries. For these and other reasons, which are very much extraneous to stock-

pile policy itself, the United States may or may not want in an individual case to undertake a proposed barter arrangement with a particular country.

I make these last few comments to illustrate the complex and very often conflicting policy considerations that must be taken into account when considering barter proposals. This is why the SIG has been reviewing the issue and why we believe that we need operational guidelines to implement existing law with respect to barter.

I will just add briefly that several studies of barter have been carried out, going all the way back into the early 1960's. These tend to have different focuses, and they do not really replace the kind of exercise we have going now, which is to make a complete review from the policy point of view rather than from the point of view of deciding whether barter is good or bad or whether it should be done or not.

Let me turn now just briefly to silver disposals.

As you know, in December 1981, when silver prices were very low, the Congress withdrew its approval for GSA to dispose of excess silver stocks and asked the administration to prepare a study on the effect of silver sales on markets for silver. This has had a tendency to slow down the stockpile program because the stockpile's holdings of silver represent one of the most important excess commodities which could be sold in order to finance acquisitions of much more high priority materials.

Since this study, to which I referred, is under the purview of the Cabinet Council on Natural Resources and the Environment, which is chaired by the Department of Interior, I would prefer to defer to that agency on the report's status.

Early this year, the Treasury Department testified on S. 269, sponsored by Senator McClure of Idaho. That bill proposes to use 105 million troy ounces of silver from the stockpile to mint coins which would be sold to the general public. At the time, we recommended that market research be done to determine the feasibility of marketing silver coins before further consideration be given to the bill. The question at issue there was how much a coin program of that type would compete with coin programs like the Olympic coin program which already were underway. We were interested in having some firm estimates of the amount of silver that could be put on the market successfully through this route so that it would not be a failed program and the maximum benefit to the stockpile and, for that matter, to the Mint, would be achieved.

The Treasurer of the United States and the Bureau of the Mint intend to examine the study findings and the methodology very soon, at which time the Department would be better prepared to comment on its finding.

That completes my formal remarks. I would be very pleased to answer any questions you may have, sir.

[The prepared statement of Mr. Cornell follows:]

PREPARED STATEMENT BY R. A. CORNELL, DEPUTY ASSISTANT SECRETARY, U.S. DEPARTMENT OF TREASURY

I appreciate the opportunity to present the Treasury Department's views on barter and the sale of silver from the stockpile. Our interest focuses primarily on

the current review of government barter policy. I will describe briefly the role of the Senior Interdepartmental Group on International Economic Policy (SIG-IEP) in the Administration's examination of policy regarding the barter of CCC and/or other government-owned property for strategic materials. The SIG has had the issue under review and the matter is now at the White House for decision, but Administration policy has not yet been finally determined. We expect such a determination soon. As regards silver, we have considered proposals for using stockpiled silver in commemorative and bullion coins, and I will comment briefly on that review.

POLICY IMPLICATIONS OF BARTER FOR STOCKPILE MATERIALS

The discussion of stockpile barter in the SIG-IEP complements the recent policy reviews of the broader issue of countertrade carried out in the Trade Policy Committee framework.

It is clear from this USTR-led review of countertrade that the Administration will likely discourage a revival in identical form of the extensive barter programs that the Government undertook during the 1950's and 1960's. Implementation of those programs required substantial administrative effort, and frequently resulted in displacements of commercial sales and limited U.S. flexibility in obtaining the least cost supplies.

Nevertheless, several existing laws do authorize barter when it is in the best interests of the United States. In fact, this Administration negotiated a barter arrangement with Jamaica last year which was mutually beneficial to both countries. Since other proposals are likely, we are moving to develop more specific policy guidance on handling them.

The barter issue has been discussed thoroughly within the SIG-IEP, but we have not yet arrived at an Administration position. As a result of the SIG-IEP review, Secretary Regan, as Chairman of the Group, has forwarded a summary of agency positions to the NSC and requested a Presidential decision on barter policy. All agencies agree that interagency consideration of barter proposals is necessary, but the precise procedures and criteria for reviewing them are still not decided.

THE SIG-IEP

The SIG-IEP was established by the National Security Council to provide an interagency framework for discussing the international economic implications of various issues which also have significant foreign policy or national security implications. The Secretary of the Treasury chairs the group and the Secretary of State is vice chairman. Other members of the group include the Vice President, the Secretaries of Defense and Commerce, OMB, CIA, USTR, and NSC. Other agencies participate when issues in their areas of responsibility or interest are discussed. The SIG-IEP meets regularly, usually about once a week, and has effectively addressed a heavy agenda of policy issues.

In Treasury's view, the SIG-IEP is well suited to the task of examining barter proposals because these have implications for several policy areas: National defense stockpiles, Agricultural policy, International trade policy, Developing country trade balances, Foreign policy, and Budget policy.

The Department can appreciate the intense interest of several groups in the barter issue. On their face, barter proposals seem straightforward: send agricultural commodities (or any other government property) to developing countries in exchange for materials which we need for our stockpile. Very often countries producing raw materials need additional imported food and have excess supplies of strategic commodities they could send us. But to complete these exchanges, the U.S. would probably have to value the agricultural commodity below acquisition value and below U.S. market prices. This would amount to an export subsidy and could be a violation of General Agreement on Tariffs and Trade (GATT) rules.

The procedure for acquiring materials for the stockpile requires careful attention to priorities so that the most critical materials are acquired first. Since proposed barter arrangements often involve commodities which are not compatible with the established priority schedule, we could misallocate stockpile resources unless these priorities are maintained. That is not easy when foreign policy and domestic interest group pressures come into play.

In negotiating barter arrangements, effective budget management could be jeopardized, if the statuatory requirement to reimburse CCC is removed. The annual budget process is the best vehicle to establish our nation's priorities for stockpile acquisitions relative to other national security or social programs. Bartering programs establish an off-budget funding mechanism which distorts those priorities. The present statuatory requirement that CCC be reimbursed for bartered commod-

ities insures that GSA will consider the commodities' costs and materials priorities when contemplating any barter transaction. We would be concerned about new legislation being proposed to remove the CCC reimbursement provision.

Finally, in considering barter proposals, foreign policy impacts need careful attention. Barters with concessionary terms provoke requests from other nations for similar arrangements and protests from competing exporting countries. For these and other reasons—extraneous to stockpile policy itself—the United States may or may not want to undertake a proposed barter arrangement with a particular country.

These comments illustrate the complex and often conflicting policy considerations that must be taken into account when considering barter proposals. This is why the SIG has been reviewing the issue to determine the operational guidelines the Administration may need to adopt in implementing existing law and the broad policy established by the Trade Policy Committee.

Several studies of barter have been carried out, both inside and outside the Government. They have examined the efficiency of barter as a trading tool as well as the advantages and disadvantages of barter in achieving other policy objectives, particularly stockpile goals. A staff report by the Department of Agriculture has examined past barter programs and described the advantages and disadvantages of barter in general. Also, a 1962 study by an interagency working group pointed out the many policy and practical implications of specific barter programs. Those studies indicate that though barter may be advantageous to some countries in particular circumstances, these advantages are usually overwhelmed by much greater efficiency and covenience of standard arms-length commercial transactions.

SILVER DISPOSALS

In December 1981, when silver prices were very low, the Congress withdrew its approval for GSA to dispose of excess silver stocks and asked the Administration to prepare a study on the effect of silver sales on markets for silver. Since the study is within the purview of the Cabinet Council on Natural Resources and the Environment chaired by the Department of the Interior, I defer to that agency on the report's status.

Early this year, the Treasury Department testified on S. 269 sponsored by Senator McClure of Idaho. That bill proposes to use 105 million troy ounces of silver from the stocks of the national defense stockpile to mint coins which would be sold to the general public. At the time, we recommended that market research be done to determine the feasibility of marketing silver coins before further consideration be given to the bill. Such research has been done by an independent organization and offered to the Treasurer. The Treasurer and the Bureau of the Mint intend to examine the study findings and methodology in the near future at which time the Department would be better prepared to comment on its finding.

Senator HUMPHREY. Thank you, Mr. Cornell.

We have no representative from the White House with us today. Can you tell us when the White House is prepared to make a decision on this matter which you tell us is now before the White House?

Mr. CORNELL. No, sir, I cannot tell you precisely. It certainly is the hope of Treasury and all of the other agencies that the National Security Council will act quickly to prepare the matter including any additional preparation it thinks appropriate for transmittal directly to the President's desk. We hope this will not be very long.

Senator HUMPHREY. You state that there are several existing laws that authorize barter, yet, apparently, between about 1973 and just recently there has been no barter. Why is that?

Mr. CORNELL. Well, one reason I could cite goes back to my experience a few years ago when, as a matter of fact, before I came to Treasury I was part of acquisitions and disposals for the stockpile at GSA.

We at GSA, of course, were very anxious to do some barter deals, to revive something like the program of the 1950's and 1960's. We found that there was fairly lukewarm support for the idea elsewhere in the administration, chiefly, I think, because the period of

very large agricultural surpluses that had existed in the 1950's and 1960's changed radically during the 1970's, so that for the 1970's and even on into the early part of the 1980's, there were not very many agricultural surpluses to barter with. So the program fell into disuse, and that is the state in which it exists right now.

Senator HUMPHREY. You say that other proposals, other barter proposals, are likely beyond that with Jamaica. Can you tell us a little more about that?

Mr. CORNELL. Yes, sir.

I made that statement on the basis of the clear evidence that there is a lot of interest in barter being developed here in the Congress, both on the Senate and House sides. We are finding that as interest begins to generate, we get various proposals, serious and not so serious, earnest and not so earnest, from various governments and countries which produce commodities they would like to sell. This is especially true during the recent period of depressed commodity prices, and especially for commodities which are marketed through national marketing organizations. They very often see a barter transaction which can be designed and disguised to avoid the cash market. It is a way of unloading excess stocks to the United States without affecting the market all that much and depressing the price further.

So, for example, we have had proposals on things like copper, which is not a high-priority commodity, and where you would have domestic mining interests which would look askance at our buying very much copper from someplace outside of the United States. There have been nickel proposals dealing with the U.S.S.R. That was a "nickel for dairy" trade, which raises all kinds of policy questions, indeed questions which were so serious that it is very likely that one of the agencies which is very probarter, namely, the Department of Defense, might very well be opposed to that kind of deal because of its basic policies regarding trading with the Soviets.

I would say there may be half a dozen proposals that are more or less seriously on the table now. I think it is a safe bet to assume that there will be more as time goes on.

This is the reason why we felt we needed a coherent and clear policy for handling it.

Senator HUMPHREY. You state that you are concerned about new legislation proposed to remove the Commodity Credit Corporation reimbursement provision.

Why is that?

Mr. CORNELL. Well, we in Treasury have several reasons for feeling this way.

First, we believe that the most efficient way to handle the questions of how much bartering we should have, which commodities we should use, and how much money we should spend on it—and it will involve expenditures as it is not a free good and there is no way to escape the budgetary costs on one side or the other of the transaction—the best way to manage that issue is to manage it within the context of discipline of the budgetary review.

I do truly believe this, even though, as I mentioned before, I come from a former incarnation where I was on the side of an agency which was trying to push barter transactions and found the

budgetary review process to be, well, not a constraint, but something that had to be dealt with.

Nevertheless, good order management, and control of the whole process by both the Congress and the administration I believe need to be accomplished through a budgetary process that does not, for example, take away from the GSA the discipline of controlling costs as much as possible. If GSA does not have to reimburse CCC for one side of the barter transactions it engages in, the discipline placed on the GSA is thereby weakened.

Senator HUMPHREY. Did the SIG make any recommendations that require legislative action?

Mr. CORNELL. No, sir.

I think the major recommendations of the SIG—and they were less recommendations than an outline of where the agency stood on the issues--were much more procedural than they were substantive. This is in the sense that, as we looked at the issue, we found that ample authorities to barter do exist now. There would be no need, for example, if the administration decided it wanted to move rapidly into a big, broad, barter program, for new legislation to authorize that. This kind of authorization certainly exists on the books now.

Therefore, we felt there was no real need to seek legislation. But there was a very strong need for us to get our act together and figure out how we were going to handle these proposals in a consistent way, so that the Congress, the private sector, and everyone else involved would know where we were coming from on a particular proposal.

Senator HUMPHREY. Did the SIG review the GAO study on barter?

Mr. CORNELL. Yes, sir, that was one of the documents that was reviewed in the process of preparing the paper.

Senator HUMPHREY. I am going to ask Treasury to provide for the record a list of each meeting held by the SIG, including a list of the representatives of each Department who attended.

Can you do that?

Mr. CORNELL. Yes sir, we will include also the working groups and the lower level groups that prepared things for Cabinet level review.

Senator HUMPHREY. If you would provide that information, we would appreciate it.

[The information follows:]

[Enclosure A]

SENIOR INTERDEPARTMENTAL GROUP-INTERNATIONAL ECONOMIC POLICY MEETING OF NOVEMBER 2, 1983

AGENCIES ATTENDING

White House: Office of the Vice President, Office of Management and Budget, Office of the Special Trade Representative, National Security Council, Council of Economic Advisers, Office of Cabinet Affairs, Office of Policy Development, and Assistant to the President.

Departments: Treasury, State, Defense, Interior, Agriculture and Commerce.

Agencies: Central Intelligence Agency, Federal Emergency Management Agency, General Services Administration, Agency for International Development.

[Enclosure B]

INTERDEPARTMENTAL GROUP-INTERNATIONAL ECONOMIC POLICY MEETING OF OCTOBER 19, 1983

AGENCIES ATTENDING

White House: Office of the Vice President, Office of Cabinet Affairs, Office of Policy Development, Office of Management and Budget, Council of Economic Advisers, National Security Council, and Office of the Special Trade Representative.
Departments: Treasury, State, Defense, Interior, Agriculture and Commerce.
Agencies: Central Intelligence Agency; Federal Emergency Management Agency and General Services Administration.

Senator HUMPHREY. Thank you very much, Mr. Cornell.

Mr. CORNELL. Thank you, Mr. Chairman.

Senator HUMPHREY. I would now like to invite to the witness table Congressman Cooper Evans of Iowa.

Good morning, Congressman. We are glad to have you here.

STATEMENT OF HON. COOPER EVANS, A REPRESENTATIVE IN CONGRESS FROM THE STATE OF IOWA

Mr. EVANS. Thank you, Mr. Chairman.

It is indeed a pleasure to be here, and I truly appreciate the opportunity to appear before the committee today.

As my introduction and cosponsorship of several bills on barter attest, I am very much interested in this subject and I commend you for calling these hearings.

I suspect that I come before this subcommittee with a little different viewpoint than the subcommittee, and from a different direction. As a member of the House Agriculture Committee, I tend to focus my attention on methods to stimulate agricultural exports and, as you know, the total value of our agricultural exports has declined sharply in the past 2 years.

The circumstances that now exist in the U.S. agricultural sector are similar to those under which the barter program of the 1950's flourished. The main difference is in the type of agricultural products currently in surplus and owned by the U.S. Government. During the 1950's, an overabundance of grains was owned by the Government, whereas now it is dairy products that are overflowing into Government warehouses. As of November 10, Commodity Credit Corporation uncommitted dairy stocks included 381 million pounds of butter, 899 million pounds of cheese, and 1.36 billion pounds of nonfat milk. The value of these products is approximately $3.15 billion.

As this subcommittee is well aware, the national defense stockpile is over $10 billion short of materials needed to sustain this country in the event of a national emergency. The argument for barter is strengthened when our import dependency for the strategic materials is considered. I conclude that the surplus of dairy products could be effectively utilized to reduce that $10 billion deficit of the national defense stockpile if only the current law relating to barter is updated or if this administration takes an aggressive position toward promoting such transactions.

As it stands now, only two barter deals involving U.S. Government surplus dairy stocks have gone forward, and those were explicitly mandated by the President. The first agreement, signed in

February 1982, involves the exchange of 400,000 tons of Jamaican bauxite for 9,115 metric tons of nonfat dry milk and butter oil. The General Services Administration will reimburse the Commodity Credit Corporation for the bauxite by the end of the current fiscal year.

The second barter agreement with Jamaica was signed just yesterday. The United States will receive an additional 400,000 tons of bauxite in exchange for 14,295 tons of nonfat dry milk and butter oil, which is valued at $13.6 million.

In addition, President Reagan has directed the CCC and General Services Administration to procure 600,000 additional tons of Jamaican bauxite for the stockpiles through agricultural barter, and I commend the President on his decision.

In this Congress, over 20 bills to revive and update our barter laws have been introduced. I have cosponsored and introduced several pieces of legislation aimed at updating the barter provisions. There is a growing consensus among those interested in this issue that the following revisions are important. But, first, I would agree that no revisions in the law are truly necessary if there is an aggressive attitude on the part of the administration to pursue barter, but that has not existed, at least up to this time.

So, if one is going to change the law, I think several things are important.

The first of these is to encourage renewed involvement by the private sector, especially by again allowing multilateral contracts and by allowing the Government to accept offers rather than always having to initiate them—adequate provisions to accomplish this are contained in H.R. 3544, S. 1683/H.R. 3991, and H.R. 2428.

The second one has to do with revision of accounting procedures that allow the transfer of funds between agencies. In other words, reimbursement of the Commodity Credit Corporation should not hold up a potential deal, as it has so often in the past—adequate provisions are contained in H.R. 3544 and S. 1683/H.R. 3991.

The third one is that there is a need, I think, for some reorganization of the stockpile management so that decisions are easily made and the transactions facilitated.

Currently, the stockpile management responsibilities are spread between the GSA, FEMA, Department of Defense, and the Department of State. When the barter of agricultural products is considered, the full interagency process becomes involved and that process is so unwieldly that positive decisions are the rare exception rather than the rule—H.R. 3544 creates a Barter Promotion Council, S. 1683/H.R. 3991 elevates management to the Office of the President; and H.R. 3295/S. 1603 avoids the problem by mandating that a certain amount of dairy products be bartered for the next 2 years.

I have listed in my testimony a number of the bills that have been introduced which apply to those three points.

Turning to a different subject, I would pose the following question to the members of this subcommittee: why is it that we insist on always buying or bartering to obtain materials for the national defense stockpile? Why not achieve this same result by merely warehousing the materials in this country, instead of acquiring

title to them through purchase or barter, and at the same time expanding our exports?

Our existing programs of guaranteed and insured export credits are not helping promote commercial sales to nations which are very poor credit risks. We do not now, and probably should not, guarantee or insure unsecured credit to such high-risk nations in spite of their long-term potential as export markets. This idea which I am presenting centers on the principle that if a nation is ineligible for unsecured credit, then we should vigorously seek out mechanisms that will provide secured credit for financing exports to that nation.

To expand on this concept, I recently introduced a bill, H.R. 4109, which would enhance the national defense stockpile while at the same time creating secured credit for the export of U.S. agricultural products. The concept involves creating a mechanism whereby materials needed for the stockpile would be shipped to the United States for storage. The foreign owner would retain title, but a warehouse receipt would be issued by our Government for this material.

The exporter and the foreign owner, a potential customer, could then go to a U.S. bank with the warehouse receipt and use it as collateral for a loan to finance one or more export transactions. The warehouse receipt would, of course, contain certain provisions attractive to the stockpile, namely, that in the case of a national emergency, the U.S. Government reserves the right to purchase the material at the then-current price and reserves the right of first refusal if sale or removal of the commodity is contemplated.

This provides a mechanism whereby the stockpile is assured access to additional materials without having to purchase those materials. The concept should be attractive to our OMB and to a number of foreign countries, especially when world markets for minerals and metals are depressed, as they are at the present time.

The concept easily could be expanded to include the strategic petroleum reserve. As the bill is now written, a new Strategic Material Bank Corporation would be created to perform the functions I have just described; but there are many possible ways of applying this concept.

Let me comment on the name "Strategic Material Bank Corporation." The concept is not a bank in the sense of a financial institution, but a bank in the sense of a storage type operation, such as the blood bank.

This idea should have an appeal to this subcommittee since it provides a mechanism whereby the stockpile is assured access to additional materials without having to purchase them. It is intended that the materials brought to the United States under this program will not serve as payment for only one transaction, but will be used as collateral for financing a series of export sales.

Mr. Chairman, I am going to have to hurry back to the House for a vote. But there is one more thing on which I would like to comment.

There was an excellent statement by Carmen Suro-Bredie of the Office of the U.S. Trade Representative made to the House Committee on Armed Services on the subject of barter. It sets forth all of the reasons why the administration is reluctant to vigorously

pursue this concept. With the chairman's permission, I would like to submit a copy of that statement to be included in the record.

Would that be possible?

Senator HUMPHREY. Yes. We would be delighted to have it.

[The prepared statement of Carmen Suro-Bredie follows:]

PREPARED STATEMENT BY CARMEN SURO-BREDIE, DIRECTOR OF SOUTHEAST ASIAN AFFAIRS, OFFICE OF THE U.S. TRADE REPRESENTATIVE

Mr. Chairman, thank you for the opportunity to appear before you and members of the Subcommittee to comment specifically on the bilateral and multilateral trading provisions of the barter of surplus government commodities for materials for the National Defense Stockpile.

USTR is responsible for coordinating trade policy within the U.S. Government. Under the Trade Expansion Act of 1962, the President established an interagency trade organization to assist him in carrying out his trade responsibilities. This organization, as it has evolved, consists of three tiers of committees administered and chaired by USTR. One of these three committees, the Trade Policy Review Group (TPRG) recently completed a review of countertrade and barter. The TPRG is composed of representatives of the Departments of Commerce, Agriculture, State, Treasury, Labor, Justice, Defense, Interior, Transportation and Energy, the Office of Management and Budget, the Council of Economic Advisory, the National Security Council and the International Development Cooperation Agency. Assistant Secretaries of all of these agencies as well as representatives from the Export-Import Bank, Overseas Private Investment Corporation and the United States International Trade Commission recently met under the chairmanship of the Deputy USTR to discuss this subject. My testimony will focus on the findings of the Trade Policy Review Group.

The U.S. Government began its study of countertrade and barter in early January 1983 in response to a marked increase in barter and countertrade type transactions in world trade especially among cash-short developing countries. Traditionally, barter is used frequently by Eastern European countries because of the lack of convertibility of their currencies. The practice has spread to developing countries, generally because of the foreign exchange shortages accompanying the recession. We expect that as the world economy recovers the use of barter transactions will diminish. For the moment however, many of these countries have approached the U.S. Government with barter proposals. One goal of the study was to develop guidance for U.S. Government agencies as to the possible circumstances in which the United States should be party to a barter transaction.

In developing a policy on barter, the TPRG reviewed the history of U.S. Government involvement in barter; the applicability of U.S. trade laws and past policy statements by U.S. Government officials. The TPRG analysis also included the use of barter in market and non-market economies, the implications of countertrade and barter on the articles of the General Agreement on Tariffs and Trade, and past policy statements by other developed countries in the context of the Organization for Economic Cooperation and Development (OECD).

In the course of this review, U.S. Government agencies found that the recent, increased use of barter is causing distortions in the multilateral trade and payments system. By concealing the *real* prices and costs of transactions, barter may conceal and help perpetuate economic inefficiencies in the market place. This lack of transparency is especially troublesome if it makes it possible for a government to subsidize or dump exports when such actions would not be possible through normal channels.

Barter was found to be a return to a bilateral system of trade at a time when the international community is seeking to safeguard and widen a multilateral trading system. Barter transactions are not subject to international rules nor are they subject to multilateral supervision.

The increased use of barter in world trade also has profound effects on the international payments system. If developing countries barter their exports instead of sell them, they reduce the foreign exchange available to repay foreign debt. Barter takes no account of the progress achieved in international settlements. The IMF generally has not looked favorably on countertrade and barter. Its loans and rescheduling of private bank loans are conditional on specific programs for increasing export earnings. These requirements generally are inconsistent with bilateral approaches to trade of the kind typified by barter.

Finally, the Trade Policy Review Group found that barter arrangements increase government intervention in the trading system, thereby raising the possibilities for discrimination and distortion. This intervention is heightened if barter arrangements are formalized by long term trade agreements or monitored by clearing accounts.

In the course of study, the Trade Policy Review Group also looked briefly at the past use of barter by the U.S. Government. The agencies found that the private trade barter program administered by the Department of Agriculture was successful in helping reduce the inventory of Commodity Credit Corporation commodities but the program did present some problems. The system could not assure that barter exports did not displace dollar sales. Also barter allowed price discounts which encouraged price-cutting by other exporting countries, resulting in market disruptions and a general lowering of the price level of agricultural exports. To the extent this lowered world prices and U.S. exports, it would increase our domestic surplus and require further outlays by the CCC, thereby aggrevating the problem it sought to solve.

As a result of the distortions which the widespread use of barter could have on the multilateral trade and payments system and the problems experienced by the CCC barter system in the past, the Trade Policy Review group recommended that the U.S. Government exercise caution in the use of its barter authority, reserving it only for those situations which offer advantages not offered by conventional market operations.

Mr. Chairman, that completes my prepared remarks, I would be happy to address any questions you or other members of the subcommittee might have.

Mr. EVANS. Thank you very much for letting me appear before the subcommittee this morning.

Senator HUMPHREY. Thank you, Congressman Evans. I wish you well, particularly in the effort to create the commodity bank you described. It sounds like a very clever and innovative approach.

I know that you are in a hurry, but might I ask where this measure lies. Is it making any progess?

Mr. EVANS. No; not at the present time. But I would encourage you to take anything that you think is of value from that bill and include it in legislation that you are considering.

Senator LEVIN. I also would like to commend you. Also, I wish you luck on getting back to the House for your vote.

I do have one quick question.

What do you do when the loan is paid off? Do you send back the commodity, which was the security?

Mr. EVANS. No; I think it would undoubtedly stay here. I think it would make little economic sense for it to be sent back If the need for it had run its course as far as the owner was concerned, and the market price were good, that owner would probably take it out of the bank and sell it on the commercial markets.

But, as I have said, the warehouse receipt would give the Government the option to acquire it at the market price at that time. So, we would risk nothing and could only gain. The only cost would be storage.

Thank you very much, Mr. Chairman.

Senator HUMPHREY. Thank you, Congressman.

Let me now ask Dr. Leo Mayer from the Department of Agriculture to come to the witness table.

But before Dr. Mayer begins, let me ask Senator Levin if he has an opening statement.

Senator LEVIN. Well, my opening statement is only one of shock, disappointment, and surprise, frankly, that we don't have OMB with us this morning. That is the shortest opening statement I have ever made. [General laughter.]

Senator HUMPHREY. I am likewise disappointed, and have asked that a hearing be scheduled as soon as the Congress reconvenes in the next session. If the administration is not ready at that point to come and at least deal with us, I am going to have some rather harsh remarks to make in public about the lack of cooperation in dealing with this severe problem, which really goes unaddressed year after year.

Senator LEVIN. Mr. Chariman, I would support any effort to get the needed witnesses here from OMB and from the Interior Department as well on the silver sale issue, including a subpena, if we have to.

Senator HUMPHREY. Yes, I quite agree with that.

Senator LEVIN. I know that the chairman of this subcommittee, as I am, is interested in getting this stockpile in the kind of condition it should be in. It is absolutely critical to us in terms of our security. I find it unbelievable, frankly, that this subcommittee has been flaunted the way it has been.

Was an excuse given us this morning for OMB not coming or did they just not show up?

Senator HUMPHREY. They do not wish to appear until the administration has made a decision on the proposals put forth by the senior intergovernmental group. They are now awaiting a decision.

Senator LEVIN. But that was a long time ago, those proposals.

Well, I will be supporting the chairman in his efforts to get the appropriate witnesses here, and the sooner the better.

I will leave it at that.

Thank you, Mr. Chairman.

Senator HUMPHREY. Thank you, Senator.

Dr. Mayer, good morning and thank you for coming

STATEMENT OF LEO V. MAYER, ASSOCIATE ADMINISTRATOR, FOREIGN AGRICULTURAL SERVICE, ACCOMPANIED BY KERRY REYNOLDS, DIRECTOR, COMMODITY CREDIT CORPORATION OPERATIONS DIVISION, FOREIGN AGRICULTURAL SERVICE

Mr. MAYER. Good morning, and thank you, Mr. Chairman. It is nice to be here.

I have a prepared statement, but much of it deals with the same things that already have been discussed by the Treasury representative and even the Congressman. So, rather than reading it, if I may, I would submit it for the record and would briefly summarize it.

Senator HUMPHREY. Sure.

Mr. MAYER. I should point out that we come from the Department of Agriculture. We are the one agency that has been successful in completing two barter agreements, the only two completed by the administration.

Furthermore, being from the Foreign Agricultural Service, we support export expansion without any degree of reservation whatever. In this line, over the past couple of years, as exports have been less than we would like, we have tried every possible method that we could think of to encourage more exports of farm products.

So, we come to you with that kind of background. Any comments on barter that seem to be less than enthusiastic have to be placed

in that light. If there were tremendous opportunities for exporting agricultural products through the barter method, we would be the first ones to grab on to that.

Second, I would make the point that there is great interest, not only on Capitol Hill and in this committee, for barter, but everywhere around the country that I go and speak, the first question that comes out of the audience is why are we not bartering more agricultural products. It is a hard question to answer because it seems like such a simple thing to do. but, in point of fact, it proves to be much, much more difficult in practice than it seems in theory.

We do have the authority to do barter arrangements, and we have used it. But there are problems. One was discussed here at some length. CCC must be reimbursed by someone, either by the agency that eventually will get the materials that are bartered for, or by the Congress through an appropriations bill.

Herein lies a big part of the problem.

The other major problem was alluded to by the Congressman, which is that CCC today does not own commodities in nearly the quantities that it did in the 1950's. It is a very important technical difference between commodities being in the CCC inventory and commodities being owned by CCC.

When the farmer puts commodities under the loan program which CCC has, the farmer retains ownership of those commodities. On the other hand, if he turns the commodities over to the Commodity Credit Corporation in payment of his loan, then the Commodity Credit Corporation owns those commodities and can do with them what it wants.

The vast majority of stocks that we have had in the past few years have not been owned by the Commodity Credit Corporation. Only dairy products are owned in any extent or quantity by the CCC. We have some tobacco stocks as well.

What this really means is that, while you hear about very large quantities of stockpiles of wheat, corn, and even soybeans until recently, and other items, CCC is not in a position to use those commodities for barter unless it first goes out and either buys them on the open market or, through some other mechanism, gets the farmer to turn them over to the Commodity Credit Corporation.

So, one real difference between today and the 1950's, when we used barter extensively, is this difference in how much we own versus how much is in the inventory. It is a critical distinction that has to be kept in mind.

Let me stop at this point and note again that the Foreign Agricultural Service is looking for every opportunity to increase agricultural exports. If Congress, either the House or the Senate, can come up with something, we would be very interested in it.

Thank you.

[The prepared statement of Mr. Mayer follows:]

PREPARED STATEMENT BY LEO V. MAYER ASSOCIATE ADMINISTRATOR, FOREIGN AGRICULTRUAL SERVICE, U.S. DEPARTMENT OF AGRICULTURE

Mr. Chairman and members of the Subcommittee, I appreciate the opportunity to discuss with you the Department of Agriculture's views on barter, particularly re-

garding current proposals to facilitate the use of agricultural barter to add to the strategic stockpile.

USDA has had authority to carry out barter arrangements since 1949 and, in fact, conducted significant barter operations during the 1950s and early 1960s. These authorities remain on the books.

For agriculture, there are some particular concerns that are not readily apparent in the barter concept. Before I dicuss these concerns some background on our authority for and use of barter might be helpful.

The Charter Act of the USDA Commodity Credit Corporation (CCC) and Section 310 of Public Law 480 provide the legislative authority. They authorize CCC to carry out barter arranagements for the exchange of agricultural commodities for strategic and critical materials if the arrangements do not displace cash sales of U.S. agricultural commodities.

CCC was granted barter authority in 1949 and operated a U.S barter program under Public Law 480 from 1954 to 1962. This program was primarily a tool for disposing of huge surplus agricultrual inventories in exchange for strategic materials.

The barter program was suspended in 1973 when CCC stocks were largely depleted, the supply of private stocks no longer justified the need for a program, and stockpile goals for strategic materials were cut back.

Since 1973, only two barter programs have been concluded. Both are with the Government of Jamaica, exchanging U.S. dairy products for Jamaican bauxite.

In the first exchange, arranged in 1982, 400,000 tons of metal grade bauxite were acquired for the National Strategic Stockpile for 7,138 tons of nonfat dry milk and 1,905 tons of butteroil owned by the CCC. The value of the transaction was $13 million.

In the second exchange, negotiations began last June for the CCC and the General Service Administration (GSA) to procure another 1 million tons of bauxite by agricultural barter. The first installment of this barter was concluded when an agreement was signed on November 17. This agreement calls for delivery of 400,000 tons of bauxite in exchange for 11,340 tons of nonfat dry milk and 2,855 tons of butteroil. The value of this transaction was $13.6 million.

Those two barters were undertaken to further both economic and foreign policy objectives. As I suggested earlier, the use of barter presents some problems. The first is the fact that at this time dairy products are the only government-owned stocks available for barter. The inventory value of the dairy stocks is as much as double their current world price, which makes it difficult to arrange any transaction to exchange products except at substantial loss to the CCC.

It is true that with a barter arrangement for surplus agricultural commodities, GSA acquired inventories of strategic materials at little or no immediate cost to the Government, and, in fact, reduced CCC storage costs on those commodities at the same time.

However, it would be necessary for CCC to recover the value of its inventory loss by appropriation from the Congress so as to restore the capital position of the Corporation, so the saving is somewhat illusory.

Another problem we encounter with barter arrangements is that the countries supplying high-priority strategic materials needed by the United States are not in need of the commodities we have available for barter. This is especially true in the current situation where CCC stocks are mostly dairy products, of which there is a large world surplus. For that reason, GSA may be forced to accept lower priority materials in order to make a barter exchange, turning to outright purchase for higher priority materials.

We are also concerned about the impact of barter transactions on the U.S. trade policy position. Under the Subsidy Code of the General Agreement on Tariffs and Trade, the United States is obligated not to subsidize agricultural exports in a manner that takes more than an equitable share of world markets or that materially undercuts prices. Since the barter of CCC commodities at this time would almost certainly involve the exchange of dairy products for materials valued at less than the acquisition cost of the dairy products, we could encounter signifcant objections by our trading partners in the GATT.

The Department is familiar with barter, we have used barter, and we have used it enough to know that it is a complex mechanism. We have participated in the Administration's review of the use of barter as a U.S. Government policy tool and are providing assistance and information to non-government organizations interested in commercial barter transactions.

That concludes my statement, Mr. Chairman. I will be glad to respond to questions.

Senator HUMPHREY. Thank you, Dr. Mayer.

How does it come about that, for instance, cheese is being distributed to the States, to be, in turn, distributed to low-income people? Who is taking the loss on that operation?

Mr. MAYER. The Commodity Credit Corporation will absorb that loss, and it will be reimbursed by the Congress through an appropriations bill.

Senator HUMPHREY. Why is the Commodity Credit Corporation willing to go unreimbursed in that case? The cheese, I assume that at some point that is perishable. Is that a correct assumption?

Mr. MAYER. Oh, yes.

Senator HUMPHREY. Now that is owned by the Commodity Credit Corporation. Nobody wants to buy it, so they are giving it away. Why can't we use that as barter for materials without reimbursement?

Mr. MAYER. Well, if it were possible to find someone overseas, a buyer, well, not necessarily a buyer, but an entity overseas which had a product or a commodity which we wanted, we being the administration or the Federal Government, and they, in turn, wanted cheese, there is no reason why that particular exchange could not take place. We have done this with Jamaica twice now, with nonfat dry milk and butter oil.

Senator HUMPHERY. For bauxite?

Mr. MAYER. Yes, for bauxite. Just yesterday, we completed the second arrangement on bauxite with Jamaica.

Senator HUMPHREY. Well, have we aggressively been seeking opportunities to get rid of this cheese, as an example, in exchange for strategic materials,

Mr. MAYER. Well, it is a little difficult to be aggressive when the cost of this cheese, and hence the price of this cheese, is substantially above the world price for this cheese. There are few buyers around the world who want to buy it. There are few people with anything to trade who are really interested in trading for it unless we take a very large loss on it.

Senator HUMPHREY. Let me focus on one aspect of this.

You say that the cost to the CCC for that cheese is above the world market price. Well, CCC is going to take a loss on that cheese no matter what, isn't it? So why not minimize its losses? Why not do something with it?

Mr. MAYER. Well, I am sure that the people who maintain the stockpile and run the dairy program have in mind that they will be able to cut back on milk production at some point such that there is less than is needed, and, hence, that cheese, butter, and powdered milk will start to come out of inventory and be used up through commercial channels. That, obviously, would be the ideal way to rid ourselves of that product.

Senator HUMPHREY. How much cheese is being thrown away in a given year because of spoilage or because it is destroyed?

Mr. MAYER. I don't have that answer.

Senator HUMPHREY. Is it a great deal?

Mr. MAYER. No, I would not say it is a great deal, at least from everything I have heard. There is a certain amount of it provided to school lunch programs and to other distribution channels. Hence, the old goes out and the new comes in.

Senator HUMPHREY. So it is not being just destroyed. It is being given out as a charity, in effect.

How much goes out under that program?

Mr. MAYER. Well, again, since I do not happen to operate that program, I don't know the quantities involved in this.

Senator HUMPHREY. But it is clear that CCC in some cases is willing to dispose of some of its commodities, cheese in this case, without reimbursement.

Are there other commodities which have been disposed of without reimbursement to CCC?

Mr. MAYER. The only other possibility is other dairy products. Within the past 2 years we have given some butter and powdered milk under this program.

Let me make one other point on utilizing dairy products.

As you know, there are countries, particularly New Zealand, which have a dependence on international markets for the sale of dairy products in order to earn the currency they need for other things. So, any time we are talking about going into world markets with sizable quantities of dairy products, we obviously have to take into account the effect that has on those countries like Ireland and New Zealand and the other countries which really depend on dairy sales in world markets.

Now there is the additional aspect of our GATT obligations. We would violate our GATT obligations if, in fact we simply dumped these products on the market.

Senator HUMPHREY. I understand about the dumping. But if two parties are willing to enter into a deal that does not involve dumping, I do not see why we don't do that more aggressively and worry less about the affairs and exports of other nations. As long as we are not dumping, we ought to be doing it aggressively, I would think.

Senator Levin?

Senator LEVIN. Is dumping involved in barter? Is that an issue when it comes to barter?

Mr. MAYER. Well, "dumping," per se, is perhaps the wrong word to use. What we do have to do is subsidize the price very substantially.

Senator LEVIN. But the complainant would not be anybody in the country with which we were bartering. The complainant presumably would be a third country, an ally who depends on those exports, perhaps, and who now will get less for them because we are driving the price down.

Mr. MAYER. Yes.

Senator LEVIN. Do we export cheese?

Mr. MAYER. Some, but we are a minor exporter of cheese. We are much more of a major importer of cheese than we are an exporter.

Senator LEVIN. Presumably, if we subsidized the price of cheese in some way, or gave it away, whatever, we would drive down the market price at that point.

Mr. MAYER. If we were to export the quantities of cheese we have in inventory, it would certainly do that.

Senator LEVIN. How much do we have in inventory?

Mr. MAYER. How much do we export?

Senator LEVIN. How much cheese do we have in inventory?

Mr. MAYER. I believe I have that number somewhere. [Pause.] It is 873.7 million pounds.

Seator LEVIN. How would that compare to a couple of years ago?

Mr. MAYER. I don't have the number for then, but it would be substantially higher than 2 years ago, though perhaps not a whole lot higher than a year ago.

Senator LEVIN. It's 878 million pounds. And that would have a value of what? How much did we pay for that?

Mr. MAYER. We should have brought our cheese and dairy expert with us this morning because we do not operate that program.

Senator LEVIN. Well, it would be over $1 billion, anyway.

Mr. MAYER. Yes; I'm sure that's true.

Senator LEVIN. More than that, I would presume.

So, we have over $1 billion worth of cheese. What other commodities do we have in our inventory that we own, putting aside how much we have that is stored there but is in somebody else's name? What would be the next largest commodity after cheese that we own?

Mr. MAYER. Dairy is the only major item that I have, although we would have some honey in inventory, some naval stores of minor quantity in inventory, and I am sure if we looked at the whole inventory of CCC we would find a lot of small things there.

Senator LEVIN. What percentage of the commodities which are in our inventories but not owned by us ultimately end up being owned by us? Is it significant?

Mr. MAYER. No, because market prices have been adequate to allow farmers to pay off the loans and sell the commodities at a profit.

Senator LEVIN. Could you get us some figures for the record as to the commodities that we own in the inventory and how much has been owned of the top 5 or 10 commodities over the last 5 years so that we could get an idea of the scope of this potential?

Mr. MAYER. Yes, sir.

[The information follows:]

CCC COMMODITY INVENTORY AS OF DECEMBER 1

Commodity/million units	1979	1980	1981		1982		1983		Minimum export sales price
			Committed	Uncommitted	Committed	Uncommitted	Committed	Uncommitted	
Butter (lb)	145.2	266.6	189.1	206.3	49.8	375.5	61.0	364.1	World market.
Cheese (lb)	19.7	189.5	68.0	556.6	91.3	786.1	143.5	855.4	Do.
Nonfat dry milk (lb)	408.4	517.7	41.0	843.9	42.4	1,218.6	84.3	1,369.2	Do.
Barley (bu)	2.8	3.2	[1] 2.7	0.6	[1] 2.7	1.4	[1] 2.7	8.1	[5] 2.92.
Corn (bu)	96.8	234.3	[1] 42.6	195.3	[1] 44.3	312.4	[4] 71.7	103.9	[5] 3.58.
Oats (bu)	2.5	2.1	[1] 1.7	0	0	0.6	0	1.2	[5] 1.82.
Rye (bu)	0.17	0.264	0	0.1	0	0.04	0	0.8	World market.
Sorghum (cwt)	23.9	23.7	[1] 15.7	5.7	[1] 15.7	9.2	[1] 15.7	12.9	[5] 6.09.
Soybeans (bu)	0	0	0	0	0	7.2	0	22.1	World market.
Wheat (bu)	49.3	196.5	[1] 147.0	42.0	[2] 147.0	32.3	[2]147.0	10.8	[5]6.03.
Rice (cwt)	6.7	0.7	0	0	0	19.4	0	1.0	World market.
Honey (lb)	0	0	[3] 1.3	0	[3] 37.1	0	[3] 33.9	0	Do.

[1] Disaster reserve.
[2] Food security wheat reserve.
[3] Domestic feeding programs.
[4] 44.3 million bushels committed to disaster reserve and 27.4 million bushels committed to emergency feed assistance program.
[5] For reserve commodities, section 110 of the Agriculture and Food Act of 1981 does not permit a lower sales price for export than required for domestic sales.

Senator LEVIN. Also, could you give us the cheese export figures, who exports cheese, and figures for tobacco, which countries export cheese and tobacco? Who are we driving the price down on is what it really amounts to.

Can you get us those figures?

Mr. MAYER. Yes, sir.

[The information follows:]

TABLE 1.—UNMANUFACTURED TOBACCO: EXPORTS BY SELECTED COUNTRIES, 1981–82

Country	1981			1982 [1]		
	Quantity (metric tons)	Value (1,000 dollars)	Unit value (dollars per kg)	Quantity (metric tons)	Value (1,000 dollars)	Unit value (dollars per kg)
Brazil	148,369	359,401	2.42	165,580	469,155	2.83
Canada	33,041	111,228	3.37	28,802	120,805	4.19
Dominican Republic	39,580	67,300	1.70	11,780	43,680	3.71
Germany, Federal Republic of [2]	12,019	14,225	1.18	13,105	19,594	1.50
Greece	86,430	273,774	3.17	71,855	211,595	2.94
India	104,862	219,908	2.10	97,887	234,766	2.40
Italy	75,810	79,426	1.05	96,901	119,213	1.23
Korea, Republic of	37,868	146,115	3.86	31,476	143,910	4.57
Philippines	29,438	48,145	1.64	26,250	(4)	(4)
Turkey	130,969	395,013	3.02	104,908	348,319	3.32
United States [3]	266,104	1,465,537	5.51	260,700	1,555,433	5.97
Yugoslavia	22,212	69,386	3.12	(4)	(4)	(4)

[1] Preliminary.
[2] Customs data.
[3] Includes re-exports of foreign grown tobacco.
[4] Not available.
Source: Official trade statistics of foreign governments.

CHEESE EXPORTS BY SPECIFIED COUNTRIES AVERAGE 1974–78, ANNUAL 1979–83

[In thousand metric tons]

Region and country	Average 1974–78	1979	1980	1981	1982 [1]	1983 [2]
North America:						
Canada	2	3	3	5	5	5
Mexico	0	0	0	0	0	0
United States	17	5	6	6	18	20
Subtotal	19	8	9	11	23	25
South America:						
Argentina	13	5	4	2	10	14
Brazil	0	0	0	0	0	0
Chile	0	0	0	0	0	0
Peru	0	0	0	0	0	0
Venezuela	0	0	0	0	0	0
Subtotal	13	5	4	2	10	14
Europe:						
Economic Community:						
Belgium-Luxembourg	12	15	18	19	17	15
Denmark	112	144	173	195	208	211
France	175	224	232	253	244	255
Germany, Federal Republic of	130	186	210	248	255	265
Greece	2	2	2	2	2	2
Ireland	48	60	37	44	47	42

CHEESE EXPORTS BY SPECIFIED COUNTRIES AVERAGE 1974–78, ANNUAL 1979–83—Continued

[In thousand metric tons]

Region and country	Average 1974–78	1979	1980	1981	1982 [1]	1983 [2]
Italy	26	34	33	38	45	45
Netherlands	242	286	275	308	315	315
United Kingdom	11	15	16	21	30	28
Subtotal [3]	758	966	996	1,128	1,163	1,178
[4]	N/A	264	327	365	380	384
Austria	33	38	41	43	44	45
Finland	29	38	38	34	31	35
Norway	20	21	19	22	20	20
Portugal	1	2	2	2	2	3
Spain	0	3	2	1	1	2
Sweden	3	3	1	2	3	3
Switzerland	56	60	64	65	65	65
Subtotal	142	165	167	169	166	173
Czechoslovakia	8	9	10	10	10	10
Germany, D.R.	19	97	96	96	96	96
Hungary	4	8	9	10	9	9
Poland	8	7	5	1	1	1
Yugoslavia	1	1	1	0	1	1
Subtotal	40	122	121	117	117	117
Soviet Union	8	8	8	9	9	9
Africa: South Africa	1	0	0	0	0	0
Asia:						
India	0	0	0	0	0	0
Japan	0	0	0	0	0	0
Subtotal	0	0	0	0	0	0
Oceania:						
Australia [5]	40	51	61	49	56	68
New Zealand [6]	73	63	69	80	81	90
Subtotal	113	114	130	129	137	158
Total	1,094	1,388	1,435	1,565	1,625	1,674

[1] Preliminary.
[2] Forecast.
[3] Includes intra-EC trade.
[4] Excludes intra-EC trade.
[5] Year ending June 30.
[6] Year ending May 31.

Note: Totals may not add due to rounding. Zero denotes unavailable, negligible, or zero.

Source: Prepared or estimated on the basis of official statistics of foreign governments, other foreign source materials, reports of U.S. Agricultural attaches and foreign service officers, results of office research and related information.—Dairy, Livestock and Poultry Division Commodity Programs, FAS, USDA.

Senator LEVIN. Is the Commodity Credit Corporation reimbursed on cheese distribution by anyone? Does Congress appropriate money?

Mr. MAYER. Well, the CCC has $25 billion of capital stock. Eventually it has to be replenished so that other programs can be operated. So, at some point Congress will pass an appropriation bill reimbursing the CCC for its losses. part of which will be this distribution of cheese.

Senator LEVIN. What would happen if we do not?

Mr. MAYER. Well, the assets of the corporation would simply diminish. Then, when farmers came in for price support loans, eventually we would run out of money.

Senator LEVIN. So, the assets of the CCC—well, when you give away cheese, that does not reduce the amount of money you have available for loans, does it?

Mr. MAYER. Well, the CCC has purchased that cheese. It has paid out funds for the cheese.

Senator LEVIN. OK, I have it. So in that sense it is very direct.

So you do not give away, in essence, anything without an appropriation to ultimately restore your accounts to where they were, including lunch programs or any other program?

Mr. MAYER. Eventually we come back to the Congress with a proposed appropriation bill to reimburse CCC for its losses.

Senator LEVIN. I guess my last question is this.

Did we authorize you to give away the cheese to the places you now are giving it away, or was that your decision?

Mr. MAYER. We do not have the right experts here to tell me why we decided to distribute cheese under the food program. I am reasonably sure it was an administration decision to try to hold down losses.

Senator LEVIN. Without congressional authority?

Mr. MAYER. Senator, I honestly do not know the answer.

Senator LEVIN. But if you have authority to give away cheese without congressional action, presumably you would have the right to barter cheese without congressional action.

Mr. Mayer. Oh, we have the authority for barter. There is no doubt about that.

Senator LEVIN. For this Jamaican deal on bauxite, you did not need any congressional authority?

Mr. MAYER. No.

Senator LEVIN. Who reimburses you for that? Does that come out of the reserve?

Mr. MAYER. GSA eventually will reimburse us for it. But it is going to be 1988 before they apparently will find the funds to do so.

Senator LEVIN. The absence of that money means then that you will have less available for loans to farmers?

Mr. MAYER. Yes; we have a certain amount of bauxite in our inventory in the sense of CCC.

Senator LEVIN. Do you transfer that bauxite to the GSA for the strategic reserve?

Mr. MAYER. Well, that is where it is at.

Senator LEVIN. Is the title transferred?

Mr. MAYER. I am informed that we hold the title until they pay us.

Senator LEVIN. So you have things in the stockpile that are owned by you titlewise?

Mr. MAYER. Yes, sir.

Senator LEVIN. So, at the time of a real emergency, we have to come to the Agriculture Department, then.

Mr. MAYER. Well, we are a part of the Government.

Senator LEVIN. Oh, I'm not worried about you. [General laughter.]

I am just thinking about the bureaucracy involved in all of this. It is just incredible.

Thank you, Mr. Chairman.

Senator HUMPHREY. It does seem like a giant shell game, doesn't it?

What advantage, then, is there in GSA acquiring bauxite in trade for cheese, or whatever it is we are doing, when ultimately GSA has to reimburse CCC with cash, cash with which it could have bought the bauxite outright? What is the point of all of this?

Mr. MAYER. Really, Senator, that is our argument, that it might be better simply to buy the bauxite outright if, in fact, that is the need.

Senator LEVIN. If I could interrupt on that point, I don't think so. I think the whole point of the chairman's bill is that it is not necessarily better to buy the bauxite if we can get rid of something that we have a surplus of to get the bauxite. I think the chairman's whole point is that there are things that you can accomplish by barter that you sometimes may not want to or be able to achieve by cash in terms of your cash priorities.

So I don't think I would agree with your answer there.

Mr. MAYER. Well, the two rather limited barter deals we have been able to work out have proven, in a sense, how difficult it is to find that perfect match between our dairy product availability and some other product.

Senator LEVIN. Mr. Chairman, forgive me for interrupting, but may I ask one more question before I leave?

Senator HUMPHREY. Yes.

Senator LEVIN. Thank you.

Do we have an aggressive program to try to barter cheese for the items that we need for our stockpile?

I don't know that I really understood the answer that you gave to Senator Humphrey on that question.

Is that your job? Did you go down the list of the items that we need for our stockpile and say by God we need, what, we need vanadium, for example? Do you know what countries even produce vanadium? I can barely pronounce it, but do you know who produces it?

Mr. MAYER. No, Senator, I do not.

Senator LEVIN. Would you be surprised if it were a very big cheese importer?

Mr. MAYER. Well, I might be. I am not sure.

Senator LEVIN. Shouldn't we be doing this? I think that is the whole point of what Senator Humphrey's bill is getting at. Shouldn't we know who it is that sells us vanadium and if they are getting cheese from somebody, then maybe we ought to be trying to peddle some cheese to them?

Mr. MAYER. Well, I guess my reaction is this. GSA is responsible for building and keeping the stockpile full. If, in fact, they see an opportunity to utilize cheese or any other commodity in a barter deal, then I would hope they would come to the Department and make that suggestion.

Senator LEVIN. So, it is their responsibility to know who it is that produces vanadium. Is that it?

Mr. Mayer. It seems reasonable to me, if they want the vanadium.

Senator LEVIN. Yes, but you are trying to get rid of the cheese. They don't have the cheese. In fact, they don't have the vanadium, that is the whole trouble.

Well, Mr. Chairman, I may be pressing on too long on this. But it seems to me that something has fallen through the cracks here.

Do we have someone from GSA here this morning?

Mr. MAYER. I don't personally know, but I don't think so.

Senator LEVIN. Well, I think the chairman is on to something here and I hope he pursues it. All the answers are not that clear, but somebody has to go over the list of stockpile needs and ask who produces vanadium and do they need cheese; and who produces manganese and do they need cheese or tobacco, or whatever we happen to have.

Mr. Chairman, Thank you for letting me interrupt you.

Senator HUMPHREY. You are more than welcome.

Mr. MAYER. Mr. Chairman, may I make one additional comment?

Senator HUMPHREY. Yes.

Mr. MAYER. I have been informed that the cheese distribution was mandated by Congress in section 111[4] of the Agriculture and Food Act of 1981.

Senator HUMPHREY. Is CCC going to be reimbursed for that distribution of cheese?

Mr. MAYER. Eventually it will have to be.

Senator HUMPHREY. How often is CCC replenished?

Mr. MAYER. Oh, it varies. It depends on whether or not we run out of money, to be honest with you. There has been the issue of even raising the ceiling when we run up against a ceiling.

Senator HUMPHREY. All right.

Will you supply for the record the amount by which CCC has been replenished through appropriations for the last 10 years or so.

Mr. MAYER. Yes, sir.

[The information follows:]

Amount received in appropriation for realized loss—net restoration

Fiscal year:	*Thousands*
1972	$4,213,331
1973	4,057,952
1974	3,301,940
1975	4,069,412
1976	2,750,000
1977	899,053
1978	524,342
1979	990,900
1980	3,056,189
1981	3,299,887
1982	7,043,229
1983	16,173,514

Note.—These figures represent appropriations received. It will not reconcile with the realized loss of any particular fiscal year. No appropriation was received during the Transition Quarter.

Senator HUMPHREY. Will you go back and explain who owns the grain which CCC is storing?

Mr. MAYER. Well, it gets a little complex because you have to understand first the price support program.

We make an offer to farmers that at harvest time, it they want to store their grain, they can come to the Commodity Credit Corporation and take out a loan. They can pledge that grain as collateral and we will give them the equivalent of the price support for that commodity—say, for wheat, $3.65 a bushel—for every bushel they put into storage. Technically, they still own that commodity, but it is pledged as collateral and it becomes part of the CCC inventory.

Senator HUMPHREY. OK. If they then cannot sell their grain for more than what you have extended them, then they don't repay the loan and you own the commodity?

Mr. MAYER. It is a nonrecourse loan. So what they can do is simply turn the grain over to the Commodity Credit Corporation and that would be in full payment of that particular loan.

Senator HUMPHREY. Well, then, why do you say you don't own it?

Mr. MAYER. Well, at that point we do own it. But the way the market has been working in the past decade, most of that time, sometime during the year the price of those commodities goes high enough so that it is to the farmer's advantage to pay off the loan and then sell the commodity into the market, rather than taking the loan rate.

Senator HUMPHREY. That's a pretty good deal. He wins either way. No wonder things are such a mess.

How much wheat do we have on hand, or any grain, as an example, which we own, have owned for some time, and which it is unlikely any farmer will reclaim?

How long are their rights good to come back and take over the ownership and resell it?

Mr. MAYER. Well, there are different programs. The initial loans are usually for 1 year, but then there are what we call reseal type arrangements where they can continue to reseal the grain and keep the loan outstanding. And there are longer term loan programs under the farmer held reserve type program, which they can put the grain under for 3 years. So it varies by the program.

As to the amount of wheat, for example, we do have in stock about 4 million tons of wheat. But the Congress requires that we maintain that particular stock of wheat which CCC owns as a protection against not being able to fulfill our food for peace agreements, our Public Law 480 agreements, in a year of short corps. So, some of the commodities owned by CCC are pledged for other purposes as required by law.

Senator HUMPHREY. Let's talk about the PIK program.

Where do you get commodities to use as payment in kind? Do you own those?

Mr. MAYER. Senator, that was one of the major problems that we ran into. We did not own adequate stocks to pay for the PIK program, to make the distributions to farmers. We had to require farmers to, in fact, turn over grain to us, to the Department, in order to make the distribution of grains under the PIK arrangements.

Senator HUMPHREY. The Department is making payment in kind of various commodities. Does it own those commodities with which it is making payment in kind?

Mr. MAYER. The answer is yes.

Senator HUMPHREY. The whole idea of the PIK program from the standpoint of the budget is to substitute commodities which we own for cash of which we are short. Isn't that the logic behind it?

Mr. MAYER. Yes, to pull down inventories.

Senator HUMPHREY. So we apparently own some inventory of commodities that we are using in the PIK program. Is that correct? Do we own them?

Mr. MAYER. Well, I know there is a shortfall, but that is another question. But we did own some quantity which proved to be insufficient. We did own some vast quantity, OK?

Mr. MAYER. Yes.

Senator HUMPHREY. That was owned. We bought it from somebody so that they could escape the market and we own it.

Mr. MAYER. Yes.

Senator HUMPHREY. Now you are giving it away in lieu of cash.

Mr. MAYER. Yes.

Senator HUMPHREY. Now the CCC cash drawer is drawn down by the value of that, right?

Mr. MAYER. That's correct.

Senator HUMPHREY. What happens next? You are going to get an appropriation to fill up the cash drawer again. So what is the difference? Why don't we just pay the farmers in cash instead of distributing commodities?

It is just a big shell game, isn't it? Maybe you could save some storage costs.

Mr. MAYER. Well, I am in the bad position of having to defend the Department for its PIK program. I don't happen to be responsible for that.

Senator HUMPHREY. I understand. But is my understanding on that point correct?

Mr. MAYER. Yes, you are correct.

Senator HUMPHREY. How much replenishment is going to be necessary by virtue of this PIK program?

Mr. MAYER. I believe the PIK distribution will be $8.9 billion.

Senator HUMPHREY. So, somewhere we are going to have to appropriate $8.9 billion.

Mr. MAYER. That's correct.

Senator HUMPHREY. I don't see the advantage in that operation.

Do we save a substantial amount—this is turning into a hearing on farm programs instead of stockpiles and barter. Do we save some substantial costs on storage? Is that some advantage?

Mr. MAYER. Well, we will reduce the inventories by that amount, the carryover of stockpiles, but not necessarily CCC owned inventories, but total inventories.

Senator HUMPHREY. Who pays for storage costs?

Mr. MAYER. The Government pays for storage costs under certain circumstances.

Senator HUMPHREY. If a farmer reclaims wheat because now he can sell it, is he charged for storage?

Mr. MAYER. Yes. The first year of the loan, he must pay the storage costs on the loan. If it is resealed into a longer term contract, then the Government pays him storage.

Senator HUMPHREY. So if he comes back after 2 years, then he does not have to pay storage?

Mr. MAYER. Well—let me go back through it one more time.

In the original 1 year loan, he has to pay the storage costs during that period. If, in fact, he pays off the loan and reclaims the commodity so that he can sell it into the market, he not only pays the storage, but he also pays interest on that money.

Senator HUMPHREY. Well, what it comes down to is everything has to be paid for. If we pay for it in commodities, then we have to appropriate cash to reimburse the CCC, cash which we just as easily have spent to purchase the commodities.

So, on the face of it, it does not seem as though there is any advantage. But maybe there is. Maybe we can play a little game the way everybody else is playing a game. Maybe we can get some money appropriated for the strategic stockpile by cycling it through the CCC since Congress is always so willing to spend money on the CCC. That obviously is the way to do this thing.

We can improve the situation of the strategic stockpile by cycling money through the CCC. That is what we are going to try to do.

Thank you.

Mr. MAYER. Thank you, Mr. Chairman.

Senator HUMPHREY. Let's see. Who is our next victim?

We will hear next from Mr. Edmund Pendleton of Anderson & Pendleton.

Mr. Pendleton, thank you for coming.

STATEMENT OF EDMUND PENDLETON, ANDERSON & PENDLETON, WASHINGTON, D.C.

Mr. PENDLETON. Thank you, Mr. Chairman. I am delighted to be a victim of this forum this morning. I can think of no two subjects that are of more interest to me than stockpiling and barter.

I enjoyed very much the grilling going on up to now of some very fine people in our career services. I think further exposing some of these issues is highly desirable.

In my time, I did some work for the Department of Agriculture and have also been connected with the Emergency Minerals Administration. I served as counsel to the agricultural and minerals industries, as well.

First, I would like to comment on some myths that are prevalent about stockpiling and barter. At any point, if the chairman has questions, please do not hesitate to interrupt me, as these are complicated and diverse questions.

Senator HUMPHREY. Fine.

Mr. PENDLETON. Myth: Barter is too complicated; it won't work.

Fact: From 1950 to 1973, the Department of Agriculture acquired through barter with 50 countries 60 strategic materials valued at $1.2 billion.

MECHANICS OF BARTER

Myth: Barter only works by price cutting, which is disguised.

Fact: Barter works because two or more parties have surpluses which they cannot sell otherwise. If Jamaica has surplus bauxite and the United States declines to buy it for cash but will buy it for dairy products, you have created new business and no price cutting

was necessary. There was no market for the bauxite for cash, only through barter.

This concept was behind the establishment of the supplemental stockpile in 1954.

Senator HUMPHREY. Let me take you up on your offer to interrupt because there is a unique situation. Would you repeat what you just said, your last observation.

Mr. PENDLETON. Yes.

Barter works because two or more parties have surpluses which they cannot sell otherwise.

Now, if Jamaica has surplus bauxite and the United States declines to buy it for cash but will buy it only for dairy products, then you have created new business and no price cutting was necessary, and you have had two markets.

Senator HUMPHREY. No one was willing to buy Jamaican bauxite?

Mr. PENDLETON. No; there was no money appropriated for it.

Senator HUMPHREY. I mean on the world market.

Mr. PENDLETON. The world market was badly depressed and bauxite is an integrated industry. The aluminum companies did not need it.

Senator HUMPHREY. So there was a surplus on the market at the time?

Mr. PENDLETON. Right.

VOLUME OF BARTER

Senator HUMPHREY. And no one was willing to buy it with cash, though we were willing to buy it with cheese. That is a unique circumstance, and obviously barter will work in that case.

But how often do you find such a set of unique circumstances?

Mr. PENDLETON. Rather frequently in the commercial field.

Senator HUMPHREY. How frequently in the context of what we need to do here for the strategic stockpile? Could you make any kind of dollar estimate of how much we could reduce this $10 billion shortfall in the strategic stockpile over, say, 5 or 10 years through the use of these unique circumstances?

Mr. PENDLETON. I think it would not be difficult to double the size of the acquisition program.

Senator HUMPHREY. But there virtually isn't any, so that would not be too hard.

Mr. PENDLETON. Congress is appropriating $120 million, and I think you can certainly double that.

Senator HUMPHREY. But that is not much.

Mr. PENDLETON. That is conservative.

I do not intend to come here and make wild statements, but I think, considering the various difficulties that will be encountered doing barter, that it is possible.

Certainly the program was much larger than that in the 1950's and 1960's.

Senator HUMPHREY. So you can do more in the way of barter than just beyond the unique circumstances you described for the bauxite case?

Mr. PENDLETON. Yes.

I think there are many such deals waiting to be done. I don't think it is unique when you have a seller who has something he cannot sell and another seller who has a product he cannot sell, and you put them together. Thirty percent of the trade today in the world is being done through countertrade and barter because the underdeveloped countries are in so much debt that they no longer have any cash.

AGRICULTURAL SUBSIDIES

Senator HUMPHREY. Well, again it comes down to the question, and I am sorry to interrupt you because I know you have more to say, it comes down to the question of what is really the purpose of using cheese as the medium of exchange if, ultimately, it is cash because we have to reimburse CCC with cash—except maybe a little hoodwinking on Congress?

Mr. PENDLETON. Well, you have the cheese. That was the decision the Congress would have to make before the cows got going on their side of the transaction.

Once you have the cheese refrigerated in Government warehouses, you have a medium of transaction that you can only do one thing with, and that is get rid of the cheese. The cost of that program is to subsidize agricultural industry. Once you have paid that subsidy, the cost is lost and eventually CCC will return to the Congress to replenish its borrowing authority.

Senator HUMPHREY. Yes.

Mr. PENDLETON. So, when you start with a surplus, then you have to do something with it.

VOLUME OF BARTER

Senator HUMPHREY. Let me just clarify one or two other things and then I will let you continue.

You said you thought we could double the amount which now is being appropriated, about $120 something million a year, that we could double that.

Are you saying that we could spend maybe about $250 million a year through barter?

Mr. PENDLETON. Well, through barter the first year I doubt that you could get $250 million.

Senator HUMPHREY. Total, or $250 million through barter alone?

Mr. PENDLETON. I mean $250 million, including the appropriations for cash from the Congress.

Senator HUMPHREY. So the barter part would be about a match for the appropriation?

Mr. PENDLETON. I would think so for the first year, because you have reluctance. Barters are complicated and it does take time to negotiate. This Jamaican deal took several years to put together.

But, with willingness, I think in the second year you would see some substantial quantities added to the stockpile.

Senator HUMPHREY. The $125 million in the first year, would that increase substantially in your opinion in succeeding years?

Mr. PENDLETON. Oh, yes, I think so.

Senator HUMPHREY. How substantially?

Mr. PENDLETON. Oh, I would think you could double that again the second year.

Senator HUMPHREY. What would be the limit after a couple of years?

Mr. PENDLETON. Well, the limit is not on the quantity of surpluses. The American farmer is the most productive in the world. He can produce larger quantities.

Senator HUMPHREY. But we don't want him to do that.

Mr. PENDLETON. Well, they can, even if the Government leaves them alone and you give them a free market. The limit is the competitive problems with friendly producing countries and displacing cash sales.

Certainly we have found in the past that you do get up to a certain limit and you really cannot go much beyond that. To me, I think the stockpile being increased by $200 or $300 million a year is worth doing.

Senator HUMPHREY. Oh, I quite agree.

Mr. PENDLETON. I don't think you have to talk about a billion dollars a year in order to talk about barter or any other innovative technique.

Senator HUMPHREY. You are right.

Please continue with your statement.

SUPPLEMENTAL STOCKPILE

Mr. PENDLETON. Surely.

Continuing, in response to the myth that barter only works by price cutting, I note that this concept was behind the establishment of the supplemental stockpile in 1954. At that time, lower priority materials for which cash was not available were procured through barter. That was the whole idea of the supplemental stockpile.

INTERNATIONAL MONETARY FUND

Allegation: Government-to-government barter, like the Jamaican bauxite barter deals, may undermine foreign exchange restrictions of the International Monetary Fund.

Fact: In some cases this could occur. That is why I favor more involvement of the private trade in barter. However, there will be an occasional need for government-to-government barter where foreign policy objectives are served.

AGRICULTURAL SUBSIDIES

Myth: Through barter Jamaican housewives are getting American butter at subsidized low prices.

Fact: The Jamaicans are paying the world market price for butter. The subsidy is paid by American housewives and other taxpayers to the American dairymen.

DISPLACEMENT OF CASH SALES

Myth: Barter would displace cash sales.

Fact: Section 303 of Public Law 480 directs the Secretary of Agriculture "to safeguard usual marketings of the United States and to

assure that barters. . . will not unduly disrupt world prices of agricultural commodities or replace cash sales for dollars."

Public Law 480 also established the food for peace program, which was mentioned this morning, under which surpluses are sold for foreign currencies without displacing cash sales. However, we are accumulating unusable paper currencies in a number of LDC's like Guinea, which produce strategic materials. Shouldn't we barter for those materials instead?

SUPPLEMENTAL STOCKPILE

Myth: Barter conflicts with Department of Agriculture obligations under the Commodity Credit Corporation Charter Act to protect the assets of CCC.

Fact: The Charter Act states: "Nothing contained herein shall limit the authority of the Commodity Credit Corporation to acquire, hold or dispose of such quantity of strategic and critical materials as it deems advisable in carrying out its functions and protecting its assets."

Lower priority materials were acquired through barter for the supplemental stockpile because they were nondeteriorating and less costly to store than agricultural commodities, thus protecting the assets of CCC.

They were held in CCC inventory and no payment was made by GSA. But still, the national security was benefited because they were here in time of war. Ultimately, when the supplemental stockpile was abolished, those materials were transferred to the national stockpile without payment, without reimbursement of the CCC, which simply went back to the Congress seeking replacement of its borrowing authority.

DEFENSE PRODUCTION ACT

Question: Isn't it better to build up the U.S. mobilization base by opening new mines and modernizing refining capacity?

Answer: The Defense Production Act authorized several programs to build minerals independence. All should be used, depending on cost effectiveness. Stockpiling should be one, but not the only approach.

STOCKPILE PURCHASES

Allegation: Cash deals are better than barter.

Fact: Of course they are. I would like to urge this committee and other responsible committees of the Senate and House to authorize and appropriate larger sums for building the stockpile. The current annual appropriation of $120 million will require 100 years to do the job, and by then, many of the materials will be obsolete.

The bald fact is that we cannot get the cash needed. But we do have surpluses, and there are surplus strategic materials abroad; 30 percent of global trade is now conducted through barter and countertrade. Should the United States exclude itself from 30 percent of the world market? Do we prefer to let our surpluses rot, while glorying in our economic purity? I'd rather have a fully operational strategic stockpile.

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LEGISLATION

Mr. Chairman, this is a legislative committee. The needs of the national stockpile call for legislation. Although there is no barter bill before this committee, several bills have been introduced in the House and in the Senate. Two bills deserve special comment: S. 1683 and H.R. 3544.

Let me discuss first S. 1683.

S. 1683

Section 2 of S. 1683 would make eight findings regarding barter. These proposed findings are accurate and relevant. If enacted, they should be prescribed reading for critics who fail to support barter or any other imaginative method for replenishing the national stockpile.

Section 3(b), Coordination of Bartering Policy: The establishment of a coordinating office in the Executive Office of the President would be sound. However, I hope it will do more than "coordinate." The title of this bill is the Barter Promotion Act of 1983. Why not direct the White House office to promote barter as well?

Section 4, Private Trading Firms: Increasing barriers to cash trade have been accompanied by the creation of more state-trading companies in the less developed and in the Communist countries. These companies are no more flexible nor imaginative than government in any of its other forms. The private trade can develop multilateral deals that two or three governments acting together never could create. Encouraging participation in barter by private trading firms is essential if our exports are to be increased and the stockpile rebuilt.

Section 5, Elimination of Restriction on Multilateral Bartering: The restriction of barter to bilateral deals came about in 1968, only when strategic materials barters had largely disappeared along with the agricultural surpluses. An active and imaginative barter program cannot function within such a limitation. It should be recalled that the Department of Agriculture, prior to 1968, required proof of "additionality" for all barter exports to assure against displacement of cash sales. Market countries were rated A, B, C, or X, to reflect the cash market potential for each commodity.

There is no sound reason to limit barter to bilateral transactions.

Section 6, Reimbursement of the Commodity Credit Corporation: In my opinion, the parochial demand for reimbursement by Federal agencies has been the major barrier to the use of barter to rebuild our national stockpile. In this critical area of national defense, we should act as a single government, not a federation of agencies.

COMMODITIES ELIGIBLE FOR BARTER

At this point, may I note another myth, and that is that barter can be done only for agricultural commodities owned by the Commodity Credit Corporation. Reference to a series of acts on the books will indicate that stock held by private parties and also those under co-op ownership and those under loan to the commodity

Credit Corporation can be bartered, and they were so bartered in the 1950's and 1960's.

Senator HUMPHREY. Let me interrupt you there. Would you explain how that would work?

Mr. PENDLETON. In the 1950's tobacco was one of the main items that was bartered. None of it was owned by the Commodity Credit Corporation. The barter transaction created a credit. Once GSA had indicated that they were interested in buying a certain strategic material for a certain value, the barter contractor, if he chose to buy tobacco, would go and look at the stocks. He would make his selection, his purchase, and that was debited against his account with the Commodity Credit Corporation, which, in turn, made payment by check to the tobacco co-op. It was no more complicated than that. For those of us participating in barter deals at the time, the issue simply was: could we find a market for the tobacco, or for wheat then held in the CCC inventory.

Senator HUMPHREY. I still do not see the advantage in that. Farmers borrow money on their tobacco crop. The CCC takes title. A foreign nation wants to buy tobacco, buys that crop—for cash?

Mr. PENDLETION. If they can sell it for cash, they will do that first. The barter contractor will never see it.

Senator HUMPHREY. The idea is to trade commodities.

Mr. PENDLETON. Trade commodities for commodities, neither of which has a home for cash.

Senator HUMPHREY. Well, the problem that we are facing here is coming up with Government assets, things the Government owns to trade for things the Government wants.

Mr. PENDLETON. Right.

Senator HUMPHREY. How can we effect that process if we are using property owned by somebody else?

Mr. PENDLETON. The difference in the ownership between something held in CCC stocks and a tobacco cooperative, for example, is a legal difference. The fact is the financing of that in the beginning and in the end will be from the taxpayer through the CCC Charter reimbursement authority.

Senator HUMPHREY. OK, so it involves CCC reimbursement again.

Mr. PENDLETON. Right.

Senator HUMPHREY. There is no way to manufacture wealth out of thin air.

Mr. PENDLETON. No.

Senator, the only way to avoid the process is to change the agricultural laws so that the surplus is not created. Once it is created, you first try to sell it for cash. If the surplus does not move for cash, then you begin to look for other ways to make a sale. Then you go after whatever surplus there is. Today that would include the wheat being held under loan, because the CCC can get rid of it and find a market for it abroad; a barter deal creates that market. It is better to do that than to allow it to sit there and accumulate storage charges.

Senator HUMPHREY. OK.

Thank you.

Mr. PENDLETON. Simply to finish the point, there are a number of laws authorizing the use of cooperative and private stocks: the

act of August 11, 1939; the CCC Charter Act, section 5 (c), (d), and (f); the Agricultural Act of 1949; Public Law 480 of 1954, are examples.

S. 1683

S. 1683 suffers by restricting the barter program to disposal of agricultural surpluses. There are large resources of surplus military materials and equipment and of GSA-held surplus minerals which could be traded for critical materials for the stockpile.

Senator HUMPHREY. Would you expand upon that? For instance, the GSA-held surplus minerals, these are minerals that we once acquired but no longer need for the strategic stockpile, is that it?

MATERIALS EXCHANGES BY GSA

Mr. PENDLETON. That is correct.

Annually there is a review of what we have, what is needed. Some materials deteriorate and some become obsolete. There is a large quantity, several billion dollars worth of materials, in the national stockpile that no longer are needed under our planning for a 3-year war period. As these are released, we acquire purchasing power which I think should be used to replenish the stockpile.

Senator HUMPHREY. Yes. But why, in your opinion, has GSA not been doing this?

Mr. PENDLETON. There is some doubt that an exchange, as they call it, a certain type of barter of surplus materials already held by them for materials to be acquired by them, is exempt from the appropriations process of the Congress. In my opinion, it is. There have been doubts raised by OMB and others, and, as a result, they are told today at GSA: well, if you want to do this, then you have to charge such an exchange against your $120 million annual purchase appropriation, which kills the whole advantage of an exchange.

Senator HUMPHREY. Would you explain that further. I am not sure I understand it.

Mr. PENDLETON. All right.

Under the appropriations process that we have for the GSA, $120 million has been appropriated annually, but the money comes from the transaction fund created by the sale of the surplus minerals for cash. The negative argument against barter or exchange of surplus materials is that any time you take the materials out and trade them for another material, you have to charge that amount against the transaction fund. The quantity of acquisitions under the transaction fund annually is dependent upon an appropriation from the Congress.

So, the total deals—cash and barter—under the present philosophy at GSA are limited to the $120 million.

Senator HUMPHREY. Oh, I see.

So, whatever the value of that transaction is, on the purchase side of it, that produces the $120 million. Is that what you are saying?

Mr. PENDLETON. Yes. In my opinion, you definitely should be allowed at GSA to trade what you have in surplus for what you need, without limit. I don't see that the national security would be hurt

by that whatsoever—and I think it is desirable—nor would the budgetary process or control of OMB.

Senator HUMPHREY. Would you continue, please.

H.R. 3544

Mr. PENDLETON. H.R. 3544 would authorize barter for all surpluses, not just agricultural. It is sponsored by the entire membership of the House Armed Services Subcommittee on Seapower and Strategic and Critical Materials.

Hearings have been held. I testified in support of the bill, which is a good bill. With the chariman's leave, I would like to offer for the record my testimony before the House subcommittee on H.R. 3544.

[The information follows:]

PREPARED STATEMENT OF EDMUND PENDLETON, ANDERSON & PENDLETON, REGARDING H.R. 3544, BEFORE THE SUBCOMMITTEE ON SEAPOWER AND STRATEGIC AND CRITICAL MATERIALS, HOUSE COMMITTEE ON ARMED SERVICES, OCTOBER 20, 1983

Mr. Chairman, I appreciate this opportunity to testify in support of H.R. 3544. I have had experience with barter both within the government and as a private attorney. I served as Assistant to the Assistant Secretary of Agriculture (Foreign Agriculture and Marketing) in 1955 when the barter program was accelerated greatly by the enactment of Public Law 480. I shall comment on the bill section by section.

SECTION 2—TRANSFER OF EXCESS PROPERTY TO THE STOCKPILE

I presume that the term "Excess Federal Materials" is intended to be all inclusive. I would urge that in interpretation. Recently the press has reported that the Customs Bureau has been very successful in seizing large numbers of automobiles, boats and even airplanes as part of their work. So many have accumulated that the Bureau is running out of storage space. In spite of the severe drought there are still surpluses of dairy products and other farm commodities. GSA holds title to real estate all over the country, much of it surplus to government needs. All of this equipment, commodities and real property should be used to barter for strategic materials.

SECTIONS 2 AND 3—REIMBURSEMENT

Probably the greatest barrier to barter in recent years has been the requirement for reimbursing the agency whose surplus materials are used. Sections 2 and 3 clearly remove that barrier. The interests of the government as a whole are properly served by the amendment. The desire of each agency to make its own budget look better should not hamper more rapid growth of the national stockpile. In fairness, pressures from congressional committees can cause such parochialism.

SECTION 3—MULTILATERAL BARTER

The requirement that barters be bilateral is an anachronism. It was unnecessary when it was enacted in 1968. Regulations of the barter program at that time assured that our surpluses exported in multilateral or openend barters were additional sales, not displacing cash markets. Although in many cases the source of strategic materials may be a market for our surpluses, this will not always be true. Aggressive export marketing should be encouraged, not prohibited.

SECTION 3—PROCUREMENT REGULATIONS

Standard government procurement regulations should be waived if multilateral barters are to be created and executed. Most of the standard requirements would not apply anyway to overseas sales and purchases. That is not to say that there should be lackadaisical supervision of the contracting program. In the early days of agicultural barter, efficient supervision produced a very clean program. I am aware of only a single instance of violation of trust by a government employee.

SECTION 3—PRIVATE TRADE

I would urge the use of the private trade as mandated by this section. The growing balance of trade problems of many underdeveloped countries are leading to the creation of state trading corporations. Though perhaps justified by their own needs, these agencies are handicapped by the same red tape of all government agencies. No government is a very good trader. The only barters by this administration have been bilateral deals with state trading companies. I support the use of barter to achieve the foreign policy interests of the United States as well as the defense interests of building up the stockpile. But I think there should be a proper mix, using the talents of the private trade to create multilateral deals as well.

SECTION 3—FEES

Authorizing the payment of fees and commissions for the services of the private trade is recognizing that capitalism works. Traders will create new markets for our surpluses, if they can expert to make a fair profit.

SECTION 4—EXPENSES OF STOCKPILING

Use of materials in the stockpile to pay the expenses of building the stockpile is sound. An excellent example is the current program at GSA to upgrade inventories of chrome and mangese. The ferro-alloys industry of this country is in desperate condition. Surplus materials from the stockpile like tin and diamonds will pay for upgrading the ferro-alloys.

SECTION 6—BARTER COORDINATION COUNCIL

From the earliest days there was interdepartmental coordination of the barter program. First established under the chairmanship of the Munitions Board, the committee was know as the Inter Agency Committee on Strategic Materials. When responsibility for stockpile planning passed to the Office for Emergency Planning (OEP), located in the Executive Offices of the President, coordination of barter in fact was directed by the White House.

If barter is revived, there will be an interdepartmental coordinating committee, I am certain. No agency will want to be excluded. The essential feature of this section is the directive to the Executive Office of the President to promote and expedite barter. The earlier committees restricted barter more often than promoting it. A major transaction on which I worked in private industry was approved by two successive presidents of the United States. Each time the project came to a halt within the interdepartmental committee. Finally President Johnson, the third president to consider it, ordered it carried out and it was. I would suggest, in addition, calling for a semiannual report from the Council to the House and Senate Armed Services Committees.

SECTION 8—REVOLVING FUND

If I understand this amendment correctly, it would exempt barters from the appropriations process. Earlier efforts to accomplish this have not been accepted throughout the government. This is important and justified. The exchange of a surplus Air Force plant for titanium to be placed in the GSA stockpile is not a budget item of either agency. The value of the assets of the United States remains unchanged; the utility has been improved.

Thank you, Mr. Chairman. I would be happy to answer questions.

RECOMMENDATION

Mr. PENDLETON. Mr. Chairman, legislation is necessary, and now. May I suggest that a companion bill to H.R. 3544 be introduced and promptly be reported out by this subcommittee. Let the two Houses and two parties of the Congress set an example for the concerned departments and agencies of the executive branch. The national stockpile must be rebuilt now.

I would be happy to answer any further questions if the chairman has them.

Senator HUMPHREY. Thank you, Mr. Pendleton.

I really asked all the questions that came to my mind during your delivery. Thank you very much for your testimony.

Mr. PENDLETON. It has been a pleasure.

Senator HUMPHREY. At this point, I will enter into the record the statement of Hon. Charles E. Bennett and the statement of Hon. Bernard A. Maguire of the Federal Emergency Management Agency.

[The prepared statements follow:]

PREPARED STATEMENT OF HON. CHARLES E. BENNETT, CHAIRMAN, SUBCOMMITTEE ON SEAPOWER AND STRATEGIC AND CRITICAL MATERIALS, HOUSE COMMITTEE ON ARMED SERVICES

Mr. Chairman, thank you for this opportunity to submit a statement on barter to the Senate Subcommittee on Preparedness.

As chairman of the Subcommittee on Seapower and Strategic and Critical Materials of the House Committee on Armed Services, I have, for some time, been interested in the efficient management of our national defense stockpile and the use of barter of surplus govenment-owned commodities and surplus defense industrial property for strategic and critical materials for the stockpile.

The principal purposes of enacting the Strategic and Critical Materials Stock Piling Revision Act of 1979 was to promote the addition of strategic and critical materials for the national defense stockpile. These additions were needed to rectify the deficit position of some 37 commodities which were below the established national security goals. The Act created the National Defense Stockpile Transaction Fund. The intention of Congress in creating the Fund was to set aside money derived from the sale of excess stockpile commodities for use in the purchase of materials needed to meet established stockpile goals. Instead of being used to buy badly needed materials such as cobalt, titanium, platinum and tantalum, the revenues derived from these sales have been transferred to the general fund of the U.S. Treasury for other purposes. The effect of these actions has been to diminish the stockpile rather than to add to it. With the current budgetary situation, it is unlikely that appropriations will be made in excess of the $120 million per year as requested by the executive branch for fiscal years 1983 and 1984. At the rate of $220 million per year it will take 100 years or more to meet the stockpile goals.

Faced with the poor prospect of correcting major stockpile deficiencies under current legislative authority and the apparent lack of will of the executive branch, the House Subcommittee on Strategic and Critical Materials set about to develop alternative legislative policies which would give the executive branch the tools needed to fill up the stockpile.

Hence, H.R. 3544 was developed.

The purpose of H.R. 3544 is to provide the President with the authority to use barter in the acquisition of materials for, and the disposal of materials from, the stockpile when the use of barter is in the national interest. Any surplus or excess materials or defense industrial property under the control of the Federal Government can be used in these transactions.

H.R. 3544 incorporates a series of amendments to the Strategic and Critical Materials Stock Piling Act, Public Law 96-41, dated July 30, 1979. The amendments were designed to give the stockpile manager more flexibility in increasing the quantities as well as to upgrade the quality of materials in the stockpile. This has become particularly necessary during this time of severe budgetary constraint which precludes the appropriation of necessary funds to meet the National Defense Stockpile goals. It is, therefore, the opinion of the Seapower and Strategic and Critical Materials Subcommittee that these amendments are essential to meet the urgent needs of the stockpile.

H.R. 3544 would authorize the stockpile manager to barter excess and surplus government material and excess defense industrial property for materials needed for the stockpile when in the national interest. It would authorize the use of barter in the acquisition of materials for the stockpile as well as barter for disposal of material from the stockpile. It would authorize such barter transactions to be carried out through bilateral, multilateral, or open-end contracts, and whenever practicable, through the services of traders, brokers, converters and dealers in the private sector in order to secure the most favorable terms for the United States to meet the goals of the stockpile. It would authorize the exchange of raw ores and inferior grade materials now in the stockpile at fair market value for specification grade material

needed for the stockpile by allowing the stockpile manager to either pay cash for the ugrading services or by allowing the provider of such services to retain a portion (or toll) of such material as payment for the services provided.

Large quanitities of surplus strategic materials are now being sold as scrap by the Department of Defense and other government agencies at a fraction of the cost to purchase these same materials for the stockpile. Moreover, large quantities of surplus agricultural commodities are being distributed free through one scheme or another to foreign governments which could be bartered for strategic and critical materials produced by those same governments. It would make good business sense for the United States to upgrade and transfer these surplus materials directly to the stockpile, or to trade these surplus government-owned materials for stockpile materials of specification grade.

The bill would establish an interagency "Barter Coordination Council" in the Executive Office of the President to promote and expedite the barter of surplus materials and property of the United States for strategic and critical materials needed for the stockpile, and to establish procedures to systematically identify opportunities for barter, including a process to regularly solicit, evaluate, and respond to barter proposals from private industry and foreign suppliers for acquisition or disposal of stockpile materials.

As you will note, H.R. 3544 is much broader than S. 1683 which you, Senator Tower and Senator Symms introduced on July 26, 1983. While I completely support your bill, it seems to address only the barter of surplus agricultural commodities for needed stockpile materials, while H.R. 3544 addresses all government-owned excess and surplus commodities. It is my opinion that we need to provide the executive branch with this broader authority and direction to barter all surplus and excess materials, as well as excess defense industrial property owned by the United States, for strategic and critical materials for the stockpile.

Our subcommittee held hearings on H.R. 3544 on October 19 and 20. I would like to point out that the nonadministration witnesses and written statements provided for the record have generally been supportive of the aims and objectives of the bill. Executive branch witnesses deferred specific comments pending completion of a policy study on barter by the Senior Interagency Group on International Economic Policy charied by the Secretary of the Treasury.

If your Senate Subcommittee on Preparedness is looking for a vehicle to provide for better management for the national defense stockpile, I suggest and strongly urge you to consider introducing in the Senate a companion bill to H.R. 3544 so that both of our committees can enact legislation that will improve the management of the stockpile. World tensions as they are, it is my considered opinion that our subcommittees are essentially interested in the same ultimate goal—strengthening the National Defense Stockpile to meet any national emergency.

Thank you for this opportunity to submit this statement for your hearing record. I assure you that the House Subcommittee on Seapower and Strategic and Critical Materials stands ready to cooperate and work with your Senate Subcommittee on Preparedness to improve the National Defense Stockpile.

PREPARED STATEMENT OF HON. BERNARD A. MAGUIRE, ASSOCIATE DIRECTOR FOR NATIONAL PREPAREDNESS PROGRAMS, FEDERAL EMERGENCY MANAGEMENT AGENCY

We are pleased to submit a statement from the Federal Emergency Management Agency (FEMA) regarding the National Defense Stockpile of strategic and critical materials. The Administration is currently formulating a policy on barter. Therefore, we cannot take a position on any proposed legislation to promote the increased use of barter in acquiring and upgrading materials for the National Defense Stockpile. We would like to point out, however, the postive impacts barter has had on industrial mobilization preparedness and on overall national security. Before doing so, let us briefly review the current general status of the National Defense Stockpile.

RESTRUCTURING THE STOCKPILE

The foremost problem facing the management of the stockpile is the need to restructure the composition of the current inventory of stockpile materials. The stockpile contains materials that are in excess of goals to the value of about $4.4 billion at current prices. Disposal of these excess materials would provide funds for acquiring needed stockpile materials. For $37 of the 61 groups of materials in the stockpile, the current inventory is less than the goals. To fill the shortfalls for these materials would require acquisitions of about $9.8 billion at current prices.

Since 1979 the primary funding source for acquistions of stockpile materials has been the proceeds from disposals of excess materials currently in the stockpile. These proceeds are covered into the National Defense Stockpile Transaction Fund established by Section 9 of the Strategic and Critical Materials Stock Piling Act. In adddition to cash procurements funded through the Transaction Fund or through appropriations, there is a second method which has been employed under existing legislation by this Administration to help relieve shortfalls in meeting stockpile goals. This second method is the barter of surplus government materials in return for strategic and critical materials needed for the stockpile. Under Section 6 of the Stock Piling Act, Congress has mandated that barter is to be encouraged in the acquistion of materials for the stockpile when barter is practical and in the best interest of the United States. This position was reaffirmed by the President in his National Materials and Minerals Program Plan, submitted to the Congress in April 1982.

PAST SUCCESS WITH BARTER

The first barter contract involving the stockpile dates back to 1950 when the Commodity Credit Corporation (CCC) traded surplus cotton for chrome ore from Turkey. During the following 17 year period up to 1967, about 1.6 billion dollars of materials were delivered to the United States for Stockpiling. Appropriations were required from Congress to reimburse the Department of Agriculture for the cost of inventories used in barter.

Even though the authorizing statutes remained in effect over the 15 years between 1967 and 1982, there were no further barter contracts developed by any Administration until President Reagan took the initiative with a program to obtain bauxite from Jamaica. The first barter contract under this program was signed in 1982 and provided for the delivery of 400,000 tons of Jamaican bauxite in exchange for surplus nonfat dry milk. As a demonstration of his continued interest, the President announced in 1983 his intention to pursue a second barter contract with Jamaica, this time for one million tons of bauxite. The amount of agricultural materials involved is subject to future negotiations. FEMA has supported these recent barter transactions because they have advanced the interests of national security.

UPGRADING MATERIALS THROUGH BARTER

The earlier barter programs also provide examples of how the barter of surplus agricultural commodities can be used effectively to upgrade ores acquired through barter. From 1950 through 1961, the Commodity Credit Corporation negotiated contracts totalling about $350 million (in 1962 dollars) for the domestic processing of such ores. Examples of stockpile materials upgraded through barter include beryllium, aluminum oxide abrasive, ferromanganese, ferrochromium, tungsten carbide powder, and copper. This upgrading program provided positive support to a vital segment of the industrial mobilization base.

The exchange of excess stockpile materials can provide a useful management tool for dealing with advances in industrial technology that require upgraded forms of materials already in the stockpile. From 1968 to 1970 there were 15 upgraded materials, valued at over $225 million, that were obtained for the National Defense Stockpile through the exchange of excess stockpiled materials. These 15 materials included platinum, palladium, iridium, ferrocolumbium, and ferrotungsten.

The use of such exchanges to acquire needed stockpile materials in upgraded forms was reinstituted on December 3, 1982. On that occasion the Administration announced that an exchange of excess stockpiled materials would be used in an upgrading program to help maintain the emergency mobilization base of the domestic ferroalloy industry. The program will produce approximately 577,000 short tons of high-carbon ferromanganese and 519,000 short tons of high-carbon ferrochromium during the next ten years, thus ensuring the immediate availability of these materials for use in a national emergency.

In conclusion, we are aware of the positive impacts of barter on industrial mobilization preparedness. President Reagan was the first president in 15 years to order barter to acquire stockpile materials. He has since then reaffirmed that barter will be utilized whenever it is in the best interest of the United States.

Senator HUMPHREY. I would ask that the following statements also be included in the record: Hon. Carroll Jones of the General Services Administration; Mr. John Ray, Assistant U.S. Trade Representative for East-West Trade, Office of the U.S. Trade Repre-

sentative; and Mr. Richard E. Donnelly, Director, Industrial Resources, Office of the Under Secretary of Defense for Research and Engineering.

[The prepared statements follow:]

PREPARED STATEMENT BY CARROLL JONES, COMMISSIONER, FEDERAL PROPERTY RESOURCES SERVICE, GENERAL SERVICES ADMINISTRATION

Mr. Chairman and members of the committee, Carroll Jones, Commissioner of the Federal Property Resources Service in the General Services Administration (GSA), on behalf of Mr. Gerald Carmen, the Administrator, appreciates the opportunity to submit this agency's views concerning barter as a means of acquiring materials for the National Defense Stockpile.

An interagency group is developing an Administration position on barter as it relates to the Stockpile and other programs. This group will complete its work and report the Administration's position in the near future. However, in the meantime, GSA wishes to comment generally on barter.

There has been a long history of the use of barter in acquiring materials for the Stockpile. Through the U.S. barter program, which existed during the 1950–1973 period, the Stockpile obtained, with the direct assistance of the Department of Agriculture, approximately 60 strategic materials valued at about $1.6 billion from more than 50 different countries. Congressional appropriations reimbursed the Department of Agriculture for the cost of agricultural commodities used in the barter.

In 1979, Congress encouraged use of barter for making Stockpile procurements by passing the Strategic and Critical Materials Stock Piling Revision Act of 1979. The Act permits the President to use existing barter authorities for acquisitions when it is practical and in the best interest of the United States; however, it does not provide specific statutory authority to barter. Barters must be based on legal authorities under other legislation, such as the Commodity Credit Corporation Act (CCC) and the Agricultural Trade Development and Assistance Act. The Stock Piling Act also permits the exchange of excess Stockpile commodities, the disposal of which is authorized by law, as payment for needed Stockpile materials expenses incurred in the acquisition process, and the cost of refining, processing and rotating materials.

GSA has had recent experience with the provisions of the 1979 Act. In 1981, the agency used such barter to acquire bauxite from Jamaica. Both agricultural materials and excess Stockpile materials, as well as cash, were used to acquire 1.6 million long dry tons of bauxite valued at $67.5 million. Of this total, $31.8 million was financed by barter/exchange. GSA will also be using materials exchange in connection with the coming ferroalloy upgrading project. In the initial phase of this activity, excess Stockpile materials will be the payment medium for upgrading Stockpile raw materials into ferrochromium and ferromanganese for goal requirements.

Although barter may appear on the surface to be a relatively simple transaction, the use of the process to acquire materials on a broad scale presents a number of problems. A primary problem is valuation. Unlike a normal acquisition or disposal, in which value of materials is established in terms of dollars, barter forces valuation to be made on the basis of the relative value of two unrelated commodities. This process is especially difficult when using material presently contained in the Stockpile as barter materials due to lack of published market prices, rapidly fluctuating market prices, variation from current industry specifications and possible deterioration from long term storage.

Administrative and technical burdens also present costly hurdles in using barter as a major tool in acquisition of Stockpile materials. An individual barter transaction could involve brokers and multiple contractors as well as at least two commodities and two Government agencies. The additional time and expenses of such complex transactions must be weighed in considering any barter transaction.

Mr. Chairman and members of the subcommittee, thank you for the opportunity to submit these remarks. I would be pleased to respond to any questions you or the members of this subcommittee may have, regarding this statement for the record.

PREPARED STATEMENT OF JOHN RAY, ASSISTANT U.S. TRADE REPRESENTATIVE FOR EAST-WEST TRADE, OFFICE OF THE U.S. TRADE REPRESENTATIVE

Mr. Chairman, thank you for the opportunity to submit a statement to the subcommittee on the bilateral and multilateral trading provisions of the barter of surplus government commodities for materials for the National Defense Stockpile.

USTR is responsible for coordinating trade policy within the U.S Government. Under the Trade Expansion Act of 1962, the President established an interagency trade organization to assist him in carrying out his trade responsibilities. This organization, as it has evolved, consists of three tiers of committees, administered and chaired by USTR. One of these three committees, the Trade Policy Review Group (TPRG) recently completed a review of countertrade and barter. The TPRG is composed of representatives of the Departments of Commerce, Agriculture, State, Treasury, Labor, Justice, Defense, Interior, Transportation and Energy, the Office of Management and Budget, the Council of Economic Advisors, the National Security Council and the International Development Cooperation Agency. Assistant Secretaries of all of these agencies as well as representatives from the Export-Import Bank, Overseas Private Investment Corporation and the United States International Trade Commission recently met under the chairmanship of the Deputy USTR to discuss this subject. My statement will focus on the findings of the Trade Policy Review Group.

The U.S. Government began its study of countertrade and barter in early January 1983 in response to a marked increase in barter and countertrade type transactions in world trade especially among cash-short developing countries. Traditionally, barter is used frequently by Eastern European countries because of the lack of convertibility of their currencies. The practice has spread to developing countries, generally because of the foreign exchange shortages accompanying the recession. We expect that as the world economy recovers the use of barter transactions will diminish. For the moment however, many of these countries have approached the U.S. Government with barter proposals. One goal of the study was to develop guidance for U.S. Government agencies as to the possible circumstances in which the United States should be party to a barter transaction.

In developing a policy on barter, the TPRG reviewed the history of U.S. Government involvement in barter; the applicability of U.S. trade laws and past policy statements by U.S. Government officials. The TPRG analysis also included the use of barter in market and non-market economies, the implications of countertrade and barter on the articles of the General Agreement on Tariffs and Trade, and past policy statements by other developed countries in the context of the Organization for Economic Cooperation and Development (OECD).

In the course of this review, U.S. Government agencies found that the recent, increased use of barter is causing distortions in the multilateral trade and payments system. By concealing the *real* prices and costs of transactions, barter may conceal and help perpetuate economic inefficiencies in the market place. This lack of transparency is especially troublesome if it makes it possible for a government to subsidize or dump exports when such actions would not be possible through normal channels.

Barter was found to be a return to a bilateral system of trade at a time when the international community is seeking to safeguard and widen a multilateral trading system. Barter transactions are not subject to international rules nor are they subject to multilateral supervision.

The increased use of barter in world trade also has profound effects on the international payments system. If developing countries barter their exports instead of sell them, they reduce the foreign exchange available to repay foreign debt. Barter takes no account of the progress achieved in international settlements. The IMF generally has not looked favorably on countertrade and barter. Its loans and rescheduling of private bank loans are conditional on specific programs for increasing export earnings. These requirements generally are inconsistent with bilateral approaches to trade of the kind typefied by barter.

Finally, the Trade Policy Review Group found that barter arrangements increase government intervention in the trading system, thereby raising the possibilities for discrimination and distortion. This intervention is heightened if barter arrangements are formalized by long term trade agreements or monitored by clearing accounts.

In the course of study, the Trade Policy Review Group also looked briefly at the past use of barter by the U.S. Government. The agencies found that the private trade barter program administered by the Department of Agriculture was successful in helping reduce the inventory of Commodity Credit Corporation commodities but the program did present some problems. The system could not assure that barter exports did not displace dollar sales. Also barter allowed price discounts which encouraged price-cutting by other exporting countries, resulting in market disruptions and general lowering of the price level of agricultural exports. To the extent this lowered world prices and U.S. exports, it would increase our domestic surplus and

require further outlays by the CCC, thereby aggrevating the problem it sought to solve.

As a result of the distortions which the widespread use of barter could have on the multilateral trade and payments system and the problems experienced by the CCC barter system in the past, the Trade Policy Review group recommended that the U.S. Government exercise caution in the use of its barter authority, reserving it only for those situations which offer advantages not offered by conventional market operations.

PREPARED STATEMENT BY RICHARD E. DONNELLY, DIRECTOR, INDUSTRIAL RESOURCES, OFFICE OF THE UNDER SECRETARY OF DEFENSE FOR RESEARCH AND ENGINEERING

Mr. Chairman and members of the subcommittee, I appreciate this opportunity to appear before you today to discuss barter, National Defense Stockpile policy, and proposed silver sales from the National Defense Stockpile.

At this time, the administration is reviewing its position on barter arrangements. This review is being conducted by the Interagency Group on International Economic Policy which is chaired by the Secretary of Treasury and is being reviewed by the National Security Council. We believe a basic and comprehensive United States Government policy position on barter transactions is necessary since other Government policies can be affected such as trade policies, Commodity Credit Corporation disposal policies, and strategic stockpile acquisition and funding policies. The Secretary of Treasury is addressing these questions in his ongoing interagency group effort. We believe the results of this effort should be completed and assessed within the context of National Defense policies and planning before the administration addresses any proposed legislation.

Within existing authorities and at the request of the House Armed Services Committee, the Department of Defense has agreed to investigatae barter whererby payment for sale of surplus defense property would be in strategic and critical materials in the form and quantity useable in the National Defense Stockpile. The Defense Logistics Agency is examining alteration of its sales procedures to include this optional payment method and is working out the administrative details required to implement a test sale. Several concerns need to be resolved and procedures developed for successful implementation of this program.

With respect to National Defense Stockpile policy, the Department of Defense is an active member of the Annual Materials Plan Steering Committee which is an interagency committee chaired by the Federal Emergency Management Agency. This Steering Committee develops a proposed list of materials for purchase and sale according to national security policies. The Strategic Implications Subcommittee, chaired by the Department of Defense, determines the impact of changes in defense requirements. In addition, the Department of Defense provides information on military specifications, technology advancements, and scenario developments. In short, the Department of Defense is fully active in National Defense Stockpile management.

The Department of Defense has consistently advocated the disposal of excess silver from the National Defense Stockpile. This position is also consistent with our policy to sell excess inventories and to purchase materials needed to meet national secruity goals and where undue disruption of the usual markets of producers, processors, and consumers of such materials in avoidable to the maximum extent feasible.

This concludes my prepared statement. I will be pleased to respond to any questions the subcommittee may have.

Senator HUMPHREY. The subcommittee stands adjourned.

[Whereupon, at 12:02 p.m., the subcommittee adjourned, to reconvene upon the call of the Chair.]

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